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December 15, 1998

Via Hand Delivery

Magalie R. Salas
Secretary
Federal Communications Commission
1919 M Street, N.W.,
Suite 222
Washington, D.C. 20554

Re: **Initial Comments of PrimeTime 24 Joint Venture in Response to Notice of Proposed Rulemaking** -- CS Docket No. 98-201; RM No. 9335, RM No. 9345 – In the Matter of Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act: Part 73 Definition and Measurement of Signals of Grade B Intensity.

Dear Ms. Salas:

Transmitted herewith for association with the Initial Comments of PrimeTime 24 Joint Venture in Response to Notice of Proposed Rulemaking, which were filed with the Commission on December 11, 1998, are nine copies of revised Tabs A through D of the Exhibits to the Initial Comments of PrimeTime 24 Joint Venture in Response to Notice of Proposed Rulemaking. These revised tabs are being submitted to correct a page numbering error in Tabs A through D as initially provided to the Commission.

If you have any questions or comments regarding the foregoing, please contact me at the above telephone number.

Sincerely,

Darrin Sacks

Enclosures

cc: Don Fowler (via hand delivery)
ITS (via hand delivery)

Initial Comments of PrimeTime 24 Joint Venture in Response to Notice of Proposed Rulemaking – CS Docket No. 98-201; RM No. 9335, RM No. 9345 - In the Matter of Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act: Part 73 Definition and Measurement of Signals of Grade B Intensity.

TAB A

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF FLORIDA

MIAMI DIVISION

CBS INC., ET AL.,	.	CASE NO. 96-3650-CIV-NESBITT
PLAINTIFFS,	.	MIAMI, FLORIDA
	.	AUGUST 19, 1998
V.	.	10:10 A.M.
PRIMETIME 24 JOINT VENTURE, ET AL.,	.	
DEFENDANTS.	.	

TRANSCRIPT OF TRIAL PROCEEDINGS HAD

BEFORE THE HONORABLE LENORE C. NESBITT,

UNITED STATES DISTRICT JUDGE.

VOLUME 5

PROCEEDINGS RECORDED BY MECHANICAL STENOGRAPHY, TRANSCRIPT PRODUCED BY COMPUTER.

Q. AND WHAT ARE THE CIRCUMSTANCES FOR WHICH THE F.C.C. HAS DEFINED SIGNAL STRENGTH, T.V. SIGNAL STRENGTH MEASUREMENT PROCEDURES?

A. THERE ARE JUST TWO INSTANCES. THE FIRST OF WHICH, IN ORDER OF APPEARANCES IN THE F.C.C. RULES, IS IN THOSE CASES WHERE THE F.C.C. HAS A DOCKET BEFORE THE PUBLIC LOOKING TOWARD CHANGING THE F.C.C. RULES. IN OTHER WORDS, ONLY UPON THE VERY UNIQUE CIRCUMSTANCE THAT THE COMMISSION ASKS FOR SUCH DATA. THE SECOND --

Q. AND --

A. -- THE SECOND CASE IS VERY NARROWLY AND SPECIFICALLY FOCUSED ON DETERMINATION OF WHETHER A GIVEN COMMUNITY RECEIVES A GIVEN GRADE OF TELEVISION SERVICE OR NOT.

Q. -AND THAT IS A COMMUNITY AS OPPOSED TO AN INDIVIDUAL LOCATION?

A. IT IS A COMMUNITY OR AREA DETERMINATION.

Q. AND DO I UNDERSTAND CORRECTLY THAT FOR THE PURPOSES OF ITS PROCEDURE, THE F.C.C. HAS DEFINED A PROCESS OF SETTING OUT A GRID AND LOCATING POINTS ON A GRID FOR TAKING THE MEASUREMENTS?

A. THAT IS CORRECT. THE NUMBER OF POINTS ON THE GRID IS ACCORDING TO A FORMULA BASED ON POPULATION OF THE COMMUNITY.

Q. AND IS THAT PROCEDURE FOR LAYING OUT AND MAKING MEASUREMENTS ON A GRID AN INTEGRAL PART OF THE F.C.C. T.V. SIGNAL STRENGTH MEASUREMENT PROCEDURE?

A. IT IS.
Q. NOW, YOU HEARD JULES COHEN TESTIFY EARLIER IN THIS PROCEEDING, DID YOU NOT?
A. I DID.
Q. AND YOU HEARD HIM TESTIFY ABOUT SIGNAL STRENGTH MEASUREMENTS MADE IN SOME FOUR CITIES --
A. I DID.
Q. -- IS THAT RIGHT?

WAS IT YOUR UNDERSTANDING THAT THOSE -- TAKING THOSE MEASUREMENTS, WHICH MR. COHEN REPORTED ON, FOLLOWED OR DID NOT FOLLOW THE PROCEDURE OF LAYING OUT AND MEASURING ALONG THE GRID THAT'S A PART OF THE F.C.C. PROCEDURE?
A. THEY DID NOT FOLLOW THE GRID PROCEDURE.

MR. DEUTSCH: I SHOULD STATE FOR THE RECORD THAT IN ADDITION TO THE EXHIBIT NOTATION ON THIS DOCUMENT FOR THIS PROCEDURE, WHICH IS EXHIBIT NUMBER 670, DEFENDANTS' EXHIBIT 670, THE DOCUMENT I HAVE PROFFERED, THE WITNESS ALSO HAS OTHER -- ANOTHER WAY, THAT SAYS "EXHIBIT 260" ON IT, IN HANDWRITTEN, "D.EX-85" ON IT. BUT THOSE DO NOT RELATE TO THIS PROCEDURE AND THOSE ARE NOT -- THOSE ARE AN ARTIFACT, A COPY, AND NOT PART OF THE DOCUMENT AS BEING PROFFERED.

THE COURT: THE PROFFERED DOCUMENT IS DEFENDANTS' EXHIBIT 670.

MR. DEUTSCH: THANK YOU, YOUR HONOR.

(DEFENDANTS' EXHIBIT NUMBER 670 WAS MARKED FOR

ADOPTED MAY 29TH, 1975, THEN YOU MAY DO SO.

MR. DEUTSCH: I DO NOT WANT TO BEAT A DEAD HORSE, YOUR HONOR, OR TO FURTHER FEED ONE THAT IS ALIVE AND WELL, BUT I CAN'T AVOID NOTING THAT WE HAVE -- THIS SORT OF THING HAPPENS. AND WE HAVE, JUST A FEW MOMENTS AGO, BEEN ON THE OTHER SIDE OF IT WITH THE LETTERS THAT MISS ROHRER WAS TESTIFYING ABOUT THAT WE HAD NOT SEEN UNTIL THIS MORNING. SO I THINK BOTH SIDES ARE ENDEAVORING TO DO THIS PROCEDURE WITH, YOU KNOW, WITH COOPERATION AND UNDERSTANDING THE COMPLEXITY OF IT.

THE COURT: GO AHEAD, MR. DEUTSCH.

MR. DEUTSCH: THANK YOU.

BY MR. DEUTSCH:

Q. WELL, I WAS GOING TO ASK YOU WHETHER THIS IS THE REPORT AND ORDER IN WHICH THE F.C.C. APPROVED AND ESTABLISHED THE SO-CALLED GRID PROCEDURE. BUT YOU'VE ALREADY TESTIFIED TO THAT. SO LET ME ASK YOU INSTEAD IF YOU'RE GENERALLY FAMILIAR WITH THIS DOCUMENT.

A. I AM GENERALLY FAMILIAR WITH IT, YES.

Q. OKAY. AND DO I UNDERSTAND CORRECTLY THAT THE GRID PROCEDURE WAS ESTABLISHED BY THE F.C.C. FOR THE PURPOSES OF MEASUREMENTS TO DETERMINE AREAS OF COVERAGE?

A. THAT IS CORRECT.

Q. OKAY. AND DO I ALSO UNDERSTAND CORRECTLY FROM WHAT YOU HAVE SAID TO THE JUDGE A MOMENT AGO THAT IN THIS DOCUMENT,

ARGUES AGAINST THIS MEASUREMENT REGIME?

A. YES, THEY DO, IN THE IMMEDIATELY FOLLOWING PARAGRAPH.

Q. AND WHAT DOES THE F.C.C. CONCLUDE?

A. THEY CONCLUDE THAT ANOTHER OBJECTION OR FAILURE OF THAT PROPOSED PROCESS OR PROCEDURE IS THAT IT FAILS TO TAKE INTO ACCOUNT THE TIME VARIABILITY OF SIGNALS. AND IT POINTS OUT THAT WHILE AT ANY GIVEN TIME ONE MIGHT BE ABLE TO PINPOINT THE LOCATION OF A GIVEN CONTOUR, ONE MUST RECOGNIZE THAT AT SOME OTHER TIME THE CONTOUR WOULD BE SOMEWHERE ELSE.

Q. AND IS THAT CONCLUSION CONSISTENT WITH YOUR OWN PROFESSIONAL OPINION?

A. YES, IT IS.

Q. NOW, MR. BIBY, DOES THE F.C.C. ANYWHERE DEFINE A MEASUREMENT, A SIGNAL STRENGTH MEASUREMENT PROCEDURE FOR SATELLITE HOME VIEWER ACT PURPOSES?

A. THEY DO NOT.

Q. DOES THE F.C.C. ANYWHERE SPECIFY A MEASUREMENT PROCEDURE FOR T.V. BROADCAST SIGNAL STRENGTH WHERE ONE IS DETERMINING THE FIELD STRENGTH OR INTENSITY AT PARTICULAR, SPECIFIC LOCATIONS, LIKE A HOUSEHOLD, AS OPPOSED TO DEFINING COMMUNITY OR AREA COVERAGE OR SERVICE?

A. NO, THE COMMISSION DOES NOT.

Q. NOW, HAVE YOU BEEN EXPERIENCED IN THE COURSE OF YOUR CAREER WITH PREPARING MAPS THAT ILLUSTRATE THE LONGLEY-RICE MODEL PREDICTIONS OF SIGNAL STRENGTH AND SIGNAL COVERAGE?

A. YES.
Q. IS THE LONGLEY-RICE MODEL A MODEL THAT PREDICTS SIGNAL STRENGTH OR INTENSITY AT A PARTICULAR POINT WITH CERTAINTY, OR IS IT A PROBABILISTIC MODEL?
A. IT IS STRICTLY A PROBABILISTIC MODEL.
Q. NOW, IN CONNECTION WITH THAT ATTRIBUTE OF IT, DO I UNDERSTAND CORRECTLY FROM WHAT'S BEEN TESTIFIED TO PREVIOUSLY IN THIS COURTROOM THAT THE MODEL PERMITS THE USE OF A PARAMETER THAT CAN BE SET TO REFLECT SO-CALLED LOCATIONAL VARIABILITY?
A. IT DOES.
Q. AND DO I UNDERSTAND FURTHER THAT LOCATIONAL VARIABILITY REFLECTED THE UNCERTAINTY IN SIGNAL, IN THE GENERAL -- WELL, YEAH -- AT GIVEN LOCATIONS, DESPITE THE PREDICTION THAT'S MADE?
A. (NO RESPONSE.)
Q. LET ME ASK YOU TO TELL ME IN YOUR WORDS INSTEAD OF MY STABBING AT IT --
A. THANK YOU.
Q. -- WHAT THE LOCATION VARIABILITY REFLECTED?
A. WELL, IN MY PERSONAL VIEW, LOCATION VARIABILITY IS WHAT WE CALL THE VARIABILITY THAT'S LEFT AFTER WE TAKE EVERYTHING THAT WE CAN THINK OF TO ACCOUNT FOR, AFTER WE'VE TAKEN EVERYTHING WE CAN IDENTIFY AND HAVE ANY ABILITY TO COMPUTE, YOU'RE STILL GOING TO SEE VARIATIONS IN SIGNAL STRENGTH

WITH, AMONGST LOCATIONS THAT ARE OTHERWISE INDISTINGUISHABLE FROM ONE ANOTHER. THAT'S MY DEFINITION OF LOCATION VARIABILITY.

Q. ALL RIGHT. AND THIS PHENOMENON IS A SIMILAR PHENOMENON ASSOCIATED WITH TEMPORAL VARIABILITY?

A. YES.

Q. AND CAN YOU TELL US IN YOUR WORDS WHAT TEMPORAL VARIABILITY REFERS TO?

A. TEMPORAL VARIABILITY REFERS TO THE VARIATION OF SIGNAL STRENGTH WITH TIME.

Q. AT ANY GIVEN LOCATION?

A. IT COULD BE AT A GIVEN LOCATION, OR IT COULD BE AS, FOR INSTANCE, IN CELLULAR TELEPHONE WORK, AS THE -- ONE END OF THE PATH THAT IS IN MOTION.

Q. OKAY. AND THE LONGLEY-RICE MODEL THEN RECOGNIZES THE EXISTENCE OF BOTH KINDS OF UNCERTAINTY IN ITS STRUCTURE AND ORGANIZATION?

A. YES, WITH A DISTINCTION OR WITH A POINT HERE. LONGLEY-RICE ADDRESSES THE TIME VARIABILITY THAT OCCURS OVER CHANGES OF SEASONS, LONG TERM, MONTHS TO YEARS.

THERE IS ANOTHER TYPE OF TIME VARIABILITY THAT WE HAVE TO ADDRESS, AND THAT IS VERY SHORT-TERM VARIATIONS, AS, FOR INSTANCE, WHEN TREE LIMBS BLOW IN THE BREEZE, THAT SORT OF TIME PERIOD.

Q. AND DO I UNDERSTAND FROM YOUR ANSWER THAT THE

LONGLEY-RICE MODEL DOES NOT TAKE THAT KIND OF --

A. LONGLEY-RICE DOES NOT TAKE THE FAST TIME VARIATIONS INTO ACCOUNT.

Q. OKAY. NOW, IN ADDITION TO THE TIME AND LOCATION UNCERTAINTIES IN THE LONGLEY-RICE MODEL ITSELF, AND IN ADDITION TO THE UNCERTAINTIES THAT IT DOESN'T TAKE INTO ACCOUNT THAT YOU HAVE JUST TOLD US ABOUT, DOES THE LONGLEY-RICE MODEL CONTAIN A THIRD PARAMETER, AN OVERALL STATISTICAL CONFIDENCE PARAMETER?

A. IT DOES.

Q. AND THAT'S OVER AND ABOVE THE OTHER TWO PARAMETERS FOR LOCATION AND SPATIAL UNCERTAINTY?

A. IN ADDITION TO.

Q. NOW, DO YOU UNDERSTAND FROM BEING IN THE COURTROOM LAST WEEK THAT MR. COHEN, IN DIRECTING THE MAPS BE PREPARED FOR HIS PRESENTATION, UTILIZED 50 PERCENT AS THE SETTING FOR LOCATION ON TEMPORAL AND OVERALL STATISTICAL CONFIDENCE?

A. I DO.

Q. WE'LL TALK MORE ABOUT THAT LATER, BUT FOR THE MOMENT WHAT I WANT TO ASK YOU IN THIS CONNECTION IS HAVE YOU, WHERE APPROPRIATE, IN YOUR OWN USE OF THIS KIND OF MODELING OF SIGNAL PROPAGATION AND PREDICTION, HAVE YOU MADE YOUR OWN ESTIMATES OF TEMPORAL AND SPATIAL VARIABILITY?

A. I HAVE.

Q. AND ARE THOSE ESTIMATES EQUIVALENT TO CHOOSING

PROFESSIONAL IN THE FIELD OF BROADCASTING, WHAT, IF ANYTHING, DO YOU UNDERSTAND FROM THIS ABOUT WHETHER THE SATELLITE HOME VIEWER ACT DEFINITION OF ELIGIBILITY THAT WE'VE JUST -- I'VE JUST PUT TO YOU REFERS STRICTLY TO VOLTAGE MEASUREMENT, OR WHETHER IT ALSO RELATES TO THE ABILITY OF THE HOUSEHOLD IN QUESTION TO RECEIVE A VIEWABLE PICTURE?

A. I AM FIRM IN MY OPINION THAT THE GOAL IS A PICTURE AND ACCOMPANYING SOUND. AND IF I MAY MAKE A DISTINCTION, IF WE WERE TALKING ABOUT VOLTAGES, I BELIEVE ONE SHOULD DISCUSS QUANTI --

THE COURT REPORTER: I'M SORRY?

A. THE WORDS, INSTEAD OF "RECEIVE," SHOULD HAVE BEEN SOMETHING SUCH AS "QUANTIFY" OR "MEASURE" INSTEAD OF "RECEIVE."

Q. NOW, AS A RESULT OF YOUR PROFESSIONAL EXPERIENCE PRIOR TO THIS CASE, ARE YOU FAMILIAR WITH THE F.C.C.'S DEFINITION OF GRADE B?

A. I AM.

Q. HAS THE F.C.C. EVER DEFINED GRADE B FOR SATELLITE HOME VIEWER ACT PURPOSES?

A. NO.

Q. HAS IT DEFINED GRADE B FOR THE PURPOSES OF DETERMINING THE GENERAL AREA COVERAGE OF THE STATION OR A TRANSMITTER --

A. YES.

LONGLEY-RICE MODEL I ALLOWED YOU TO USE, BUT I WOULD LIKE TO TALK MORE GENERALLY NOW.

NOW, IF YOU WERE TO MAKE MEASUREMENTS OF SIGNALS AS YOU MOVED ALONG A PATH AND YOU RECORDED THE RESULT, OKAY, COULD YOU PLEASE ON THE WHITE PAPER HERE DRAW US WHAT A TYPICAL SUCH RECORDING MIGHT LOOK LIKE?

A. I'LL TRY.

Q. THANK YOU.

THE COURT: YOU MAY STEP DOWN.

MR. DEUTSCH: YES, MA'AM.

THE COURT: YES, YOU MAY STEP DOWN.

THE COURT REPORTER: MR. DEUTSCH, DO YOU HAVE THE MICROPHONE?

BY MR. DEUTSCH:

Q. THANK YOU.

A. I'M ABOUT TO ILLUSTRATE, BUT I AM NOT A GRAPHICS ARTIST.

(PAUSE.)

A. THE RATHER ASTONISHING CHARACTERISTIC THAT ONE SEES WHEN YOU'RE DRIVING ALONG A SHORT DISTANCE RANGE OF EITHER RECORDING OR SIMPLY WATCHING THE SIGNAL STRENGTH INDICATOR FLOP AROUND IS THE INCREDIBLE RANGE OF THE SIGNAL STRENGTHS THAT YOU OBSERVE.

AND I'M GOING TO TRY TO GIVE SOME INDICATION OF WHAT SORT OF THINGS ONE SEES (INDICATING).

AND I APOLOGIZE FOR MY INABILITIES.

THE COURT: WHERE ARE YOU NOW WHEN YOU'RE --

THE WITNESS: PARDON ME?

THE COURT: WHERE ARE YOU NOW WHEN YOU ARE CHARTING THESE STRENGTHS?

THE WITNESS: TYPICAL --

THE COURT: YOU HAVE GOT TO SPEAK INTO THE MIKE.

THE WITNESS: I THINK TYPICAL CITY STREET OR IN A WOODED AREA, JUST TYPICAL AMERICAN COUNTRYSIDE OR, YOU KNOW, TYPICAL AMERICANA.

DID I ANSWER YOUR QUESTION?

THE COURT: WELL, AMERICANA, IT'S EITHER CITY OR COUNTRY, AND I IMAGINE THERE ARE DIFFERENT VARIABLES, CORRECT?

THE WITNESS: YES. THE DEFINING FACTORS, REALLY, IN THE EXTENT OF THE VARIABILITY OF THE SIGNAL IS THE PRESENCE OF BUILDINGS AND VEGETATION.

THE COURT: OKAY.

THE WITNESS: NOW, WHAT I'VE TRIED TO DEPICT HERE IS, AS ONE MOVES ALONG A RELATIVELY SHORT DISTANCE, CONVENTIONAL PRACTICE IS ABOUT 20 WAVELENGTHS AT WHATEVER THE FREQUENCY BEING OBSERVED IS. THIS IS THE BACKGROUND BEHIND MR. COHEN'S USE OF A 100-FOOT RUN.

IN MODERN PRACTICE, ONE TAKES SAMPLES BY WAY OF SOMETHING CALLED AN ANALOG-TO-DIGITAL CONVERTER. IT RECORDS

THE SIGNALS WITH A COMPUTER. AND YOU TAKE ENOUGH SAMPLES THAT YOU CAN GET A GOOD SOLID PICTURE OF THE VARIABILITY.

MR. COHEN, OVER HIS 100-FOOT RUN, STATED HE TYPICALLY TAKES IN EXCESS OF A THOUSAND SUCH SAMPLES.

THE COURT: I HAVE GOTTEN A LITTLE EMERGENCY MESSAGE HERE I HAVE TO TAKE. SO YOU JUST SIT BACK DOWN AGAIN. I'LL JUST BE -- THE CHIEF JUDGE WANTS TO SPEAK TO ME JUST FOR A MOMENT. I'LL BE RIGHT BACK.

(PAUSE.)

THE COURT: OKAY. YOU CAN PROCEED NOW.

ARE YOU FINISHED AT THE PAD OR NOT, MR. BIBY?

THE WITNESS: NOT QUITE, YOUR HONOR.

THE COURT: ALL RIGHT. WELL, THEN STEP DOWN AGAIN, PLEASE.

THE WITNESS: WHAT I'VE TRIED TO INDICATE IS THE ENORMOUS VARIABILITY THAT ONE SEES AS YOU MOVE ALONG.

THIS HORIZONTAL LINE IS THE MEDIAN VALUE, SO RELATIVE TO THE MEDIAN, THERE IS A ZERO DECIBELS. ABOVE THE MEDIAN LINE I HAVE INDICATED PLUS TEN DECIBELS. YOU'LL NOTE THAT SELDOM, IF EVER, DOES THE SIGNAL GO AS MUCH AS TEN DECIBELS ABOVE THE MEDIAN.

I'VE INDICATED MINUS TEN, MY TWENTY, MINUS THIRTY DECIBELS BELOW THE MEDIAN. YOU WILL NOTE THAT RATHER FREQUENTLY THE SIGNAL GOES MUCH FURTHER BELOW THE MEDIAN THAN ABOVE THE MEDIAN. IN OTHER WORDS, THE SIGNAL IS HIGHLY

ASYMMETRICAL. AND ALONG THIS DIMENSION, REALLY, WE ARE TALKING ABOUT INDIVIDUAL SAMPLES.

THE COURT: ALL RIGHT.

MR. DEUTSCH: KEEP THE MIKE -- OKAY.

MR. SPECTOR: TURN IT OFF, BOTH BUTTONS DOWN.

THE WITNESS: BOTH?

MR. SPECTOR: BOTH.

BY MR. DEUTSCH:

Q. ALL RIGHT. THEN, MR. BIBY, JUST SO THERE IS NO LACK OF CLARITY IN THE RECORD, YOU'RE DISCUSSING A MEASUREMENT THAT MIGHT BE MADE OF SIGNAL INTENSITY AS YOU MOVED ALONG A PATH, BUT YOU'RE DESCRIBING A GENERIC OR TYPICAL ONE, NOT ONE THAT YOU SUGGEST REPRESENTS AN ACTUAL ONE AT A PARTICULAR PLACE, RIGHT?

A. ABSOLUTELY CORRECT.

Q. AND COULD YOU TELL US, IN YOUR EXPERIENCE, HOW MUCH IN SUCH A RUN WILL A SIGNAL TYPICALLY VARY ABOVE THE MEDIAN?

A. TYPICALLY SIX, VERY SELDOM AS MUCH AS TEN DECIBELS ABOVE THE MEDIAN.

Q. WHEN IT VARIES BELOW THE MEDIAN, HOW LOW MIGHT IT GO IN DECIBELS?

A. WELL, YOU'LL FREQUENTLY SEE EXCURSIONS BELOW THE MEDIAN. OVER 30 DECIBELS ARE, IN TERMS OF A POWER RATIO, A THOUSAND TO ONE DIFFERENCE IN THE RECEIVE SIGNAL STRENGTH.

Q. OVER WHAT DISTANCE MIGHT ONE FIND THESE VARIATIONS

OCCURRING?

A. TYPICALLY YOU SEE TWO MINIMA AND TWO MAXIMA PER WAVELENGTH, WHICH AT THE LOW V.H.F. CHANNEL 2, I BELIEVE, IS 30 OR 40 FEET; AND AT HIGH U.H.F. FREQUENCIES A FOOT OR SO.

Q. NOW, ARE THESE VARIATIONS DUE TO THE EFFECTS OF TERRAIN OR DO THEY OCCUR EVEN IN THE PRESENCE OF UNIFORM TERRAIN?

A. THEY ARE NOT DUE TO TERRAIN. THEY'RE DUE TO SCATTER FROM OBJECTS SUCH AS TREES -- WELL, CARS, BUILDINGS.

Q. AND IS THIS WHAT WE'VE TALKED ABOUT AS SPATIAL VARIABILITY PREVIOUSLY OR LOCATIONAL VARIABILITY?

A. NO, IT'S NOT LOCATION VARIABILITY. LOCATION VARIABILITY TYPICALLY OR IS OVER A SOMEWHAT LARGER AREA. THESE ARE VERY FINE DETAIL VARIATIONS, AS I COMMENTED, CAN TAKE PLACE IN A MATTER OF INCHES AT U.H.F. FREQUENCIES.

Q. OKAY. SO ARE THESE VARIABILITIES IN SPATIAL TAKEN INTO ACCOUNT IN LONGLEY-RICE MODELING?

A. THEY ARE NOT.

Q. NOW, IF INSTEAD OF MOVING ALONG A PATH MEASURING ONE STOOD STOCKSTILL AT ONE PLACE, BUT KEPT THE SIGNAL MEASURER ON AND MADE INSTEAD OF A 20 OR 40 OR HUNDRED OR 200-FOOT RUN, MADE A ZERO FOOT RUN OVER SOME PERIOD OF TIME, THEN WHAT WOULD THE SIGNAL THAT YOU TRACED LOOK LIKE?

A. THESE VARIATIONS WILL COME TO YOU, SO TO SPEAK. THEY WILL OCCUR IN TIME FROM A FIXED RECEIVING LOCATION.

Q. SO DO I UNDERSTAND THEN THAT THE SCHEMATIC DRAWING

YOU'VE MARKED HERE ON THE PAD WOULD OCCUR -- AGAIN, SCHEMATICALLY, RATHER THAN BEING SPECIFIC TO A LOCATION -- BUT A PATTERN LIKE THIS WOULD OCCUR IF YOU STOOD STILL RATHER THAN MOVED, BUT WERE RECORDING WHILE YOU WERE STANDING STILL?

A. YES.

Q. AND IS THIS A KIND OF TEMPORAL VARIABILITY?

A. IT IS.

Q. AND WHAT CAUSES THIS?

A. VEHICLES MOVING, VEHICLES MOVING, EVEN TREE LIMBS AND LEAVES BLOWING IN THE BREEZE, JUST ANY NUMBER OF CHANGES.

Q. AND DO THE LONGLEY-RICE MODEL TAKE INTO ACCOUNT THIS KIND OF TIME VARIABILITY?

A. IT DOES NOT.

MR. DEUTSCH: I'M GOING TO REFER THE WITNESS NOW TO A PREVIOUSLY ADMITTED DOCUMENT, PLAINTIFFS' EXHIBIT 343.

BY MR. DEUTSCH:

Q. NOW, MR. BIBY, I HAVE SHOWN YOU WHAT'S PREVIOUSLY BEEN ADMITTED BY THE PLAINTIFFS AS THEIR EXHIBIT 343. AND I'D LIKE YOU TO TELL ME IF YOU UNDERSTAND THAT THIS IS PRESENTED BY THE PLAINTIFFS WITH THE RESULTS OF MEASUREMENTS MADE AND PRESENTED TO THE COURT BY JULES COHEN?

A. YES, I UNDERSTAND THAT.

Q. AND, IN PARTICULAR, THIS EXHIBIT REPRESENTS MEASUREMENTS MADE FOR CHANNEL 53 IN PITTSBURGH,

PENNSYLVANIA, W.P.G.H.

A. THAT'S CORRECT.

Q. AND, AGAIN, JUST TO FOCUS, THIS PRESENTS MAXIMUM, MINIMUM, MEDIAN, STANDARD DEVIATION, AND SO-CALLED ADJUSTED FIELD INTENSITY VALUES AS PRESENTED BY MR. COHEN?

A. CORRECT.

Q. NOW, I'D LIKE YOU TO REFER TO THE LOCATION. AND I BELIEVE ACTUALLY MR. COHEN WAS ASKED ABOUT IN HIS CROSS EXAMINATION, LOCATED MAYBE 40 PERCENT OF THE WAY DOWN, LOCATION NUMBER 242. AND FOR EASE, I JUST NOTE THAT THEY ARE LISTED IN NUMERICAL ORDER. OKAY?

A. YES.

Q. NOW, FOR LOCATION 242, CAN YOU TELL THE COURT THE MINIMUM, THE MAXIMUM AND THE MEDIAN THAT MR. COHEN'S PEOPLE IN THE FIELD MEASURED AND REPORTED TO HIM?

A. WELL, FOR POINT 242, THE MINIMUM WAS 22.7 D.B.U., THE MAXIMUM WAS 63.5. I BELIEVE YOU ASKED FOR THE MEDIAN, 52.8.

Q. FOR THAT DATA POINT THEN, HOW FAR ABOVE THE MEDIAN WAS THE MAXIMUM SIGNAL?

A. THE MAXIMUM SIGNAL WAS 10.7 DECIBELS, I BELIEVE, ABOVE THE MEDIAN.

Q. AND HOW FAR BELOW THE MEDIAN IS THE MINIMUM SIGNAL?

A. 30.1 DECIBELS.

Q. AND HOW DOES THAT COMPARE WITH YOUR SCHEMATIC DISCUSSION OF THE VARIATION OF THE SIGNAL ABOUT THE MEDIAN A

MOMENT AGO?

A. WITH MY INEPTITUDE IN THE GRAPHIC ARTS, I DON'T BELIEVE I SHOWED A VARIATION QUITE THAT SEVERE. IN MY EXPERIENCE, THIS COHEN DATA IS TYPICAL OF WHAT I HAVE SEEN.

Q. I WOULD LIKE YOU TO LOOK AT ONE FURTHER LOCATION TO ILLUSTRATE THE VARIATION, AND THAT'S A LITTLE MORE THAN HALFWAY DOWN. AND, AGAIN, IT'S A LOCATION THAT MR. COHEN HIMSELF WAS ASKED ABOUT, AND THAT'S 387. AND, AGAIN, IF YOU COULD TELL US THE MINIMUM, THE MEDIAN AND THE MAXIMUM FOR THAT LOCATION.

A. THE MINIMUM IS 48.3 D.B.U.; THE MEDIAN IS 72.2; THE MAXIMUM IS 82.6, ALL D.B.U.

Q. AND, AGAIN, IN READING THESE, YOU DON'T MEAN TO PROFFER THEM AS CORRECT, BUT SIMPLY YOU'RE NOTING THAT THAT'S WHAT THEY WERE REPORTED TO THE COURT BY SOMEBODY ELSE.

A. I AM NOTING THAT I TRUST THE CAPABILITIES OF THE PERSONS PRESENTING THIS DATA, AND THAT'S THE EXTENT OF IT.

Q. OKAY. AND HERE HOW FAR FROM THE MEDIAN -- LET ME GO BACK. YOU DON'T -- YOU'RE IN NO WAY INVOLVED IN GATHERING THE DATA. YOU'RE NOT -- YOU'RE NEITHER VOUCHING FOR IT, NOR MEANING TO UNDERCUT IT BY THE REPETITION OF IT, IS THAT RIGHT?

A. THAT'S CORRECT.

Q. OKAY. GOING BACK TO 387, HOW FAR ABOVE THE MEDIAN IS THE MAXIMUM?

A. 10.4 DECIBELS.
Q. AND HOW FAR BELOW THE MEDIAN IS THE MINIMUM?
A. YOU'RE STRAINING MY OFFHAND ARITHMETIC CAPABILITIES. I BELIEVE IT'S 24 -- 23.9, I BELIEVE.
Q. AND DOES THIS ILLUSTRATE THE SAME VARIABILITY THEN THAT YOU HAVE BEEN TALKING ABOUT?
A. YES, SIR, VERY TYPICAL DATA.
Q. NOW, WERE YOU IN THE COURTROOM WHEN MR. COHEN ACKNOWLEDGED THAT THERE COULD BE SIGNIFICANT VARIATIONS IN SIGNAL STRENGTH OVER THE COURSE OF A DATA RUN?
A. YES, I WAS.
Q. AND DOES THE DATA HE'S PRESENTED ILLUSTRATE THOSE VARIATIONS, IN YOUR OPINION?
A. YES, INDEED.
Q. NOW, ARE THE VARIATIONS IN THIS EXHIBIT DUE TO TIME VARIABILITY OR ARE THEY DUE TO SPATIAL VARIABILITY OR ARE THEY DUE TO A COMBINATION OF THE TWO?
A. I SMILE BECAUSE IT ILLUSTRATES THE DIFFICULTIES ONE HAS IN DOING THIS SORT OF WORK. BOTH, THERE'S TIME VARIABILITY WITHOUT DOUBT AND THERE'S LOCATION VARIABILITY.
Q. NOW, FOR ANY GIVEN RUN WHERE MR. COHEN REPORTS THE SIGNAL AS BEING ABOVE THE GRADE B CUTOFF, BASED UPON WHAT HE DEFINED AS ADJUSTED VALUE FOR THE MOMENT -- OKAY?
A. YES.
Q. IN REVIEWING THE DATA HE PRESENTS, CAN THE SIGNAL IN

THAT -- LET ME START THAT OVER, AGAIN.

MAKING THE ASSUMPTION THAT VARIABILITY IS DUE TO TIME VARIATION, WILL THE SIGNAL BE BELOW THE ADJUSTED VALUE THAT MR. COHEN REPORTS SOME PORTION OF THE TIME AT ANY POINT ALONG THE RUN?

A. YES.

Q. DOES THIS MEAN THEN THAT THERE'S NO SITE WHERE THE HOME OWNER CAN BE EXPECTED TO HAVE A GRADE B OR A GREATER SIGNAL ALL THE TIME, DESPITE MR. COHEN'S MEASUREMENT OF THE ADJUSTED VALUE AS BEING ABOVE GRADE B?

A. GOING BACK TO THE LARGER CONTEXT OF YOUR QUESTION, I BELIEVE IT WAS FRAMED IN THOSE CASES WHERE THE MINIMUM OF ZERO VALUE WAS BELOW THE GRADE B REQUIREMENT.

Q. CORRECT.

A. THE ANSWER IS YES.

Q. NOW, HAVE YOU COME TO UNDERSTAND THAT PROFESSOR SUDMAN, THE STATISTICIAN THE PLAINTIFFS PRESENTED IN THIS COURTROOM, PRESENTED HIS CONCLUSIONS STATED IN TERMS OF A RESULT WITHIN A 95 PERCENT CONFIDENCE LEVEL AT CERTAIN POINTS?

A. I HEARD HIS -- TOWARD THE END OF HIS TESTIMONY. AND I BELIEVE THAT WAS PART OF THE DISCUSSION.

Q. AND ASIDE FROM HIS USE OF THE 95 PERCENT CONFIDENCE LEVEL, ARE YOU, YOURSELF, AS AN ENGINEER FAMILIAR WITH THE USE OF 95 PERCENT LIKELIHOOD AS A METHOD OF REPORTING WHETHER OR NOT A RESULT IS SIGNIFICANT?

OBJECTION TO THE COURT'S PRECLUDING YOU FROM CERTAIN EVIDENCE WOULD BE SUFFICIENT WITHOUT A PROFFER.

BUT I AM NOT GOING TO PRECLUDE YOU FROM CONTINUING TO PRESENT TESTIMONY THROUGH THIS WITNESS. BUT I AM JUST TELLING YOU WHERE I'M COMING FROM AND HOW MY THINKING IS AT THIS PARTICULAR POINT SO THAT YOU CAN FOCUS YOUR INQUIRY AND SHOW ME FROM HIS EXPERT --

MR. DEUTSCH: I'M GOING TO FOCUS ON ATTEMPTING TO PRESENT YOU WITH EVIDENCE, AS TO GIVEN -- GIVEN THE INTERPRETATION THAT THE COURT HAS ADOPTED, AND NOT CHALLENGING THAT INTERPRETATION.

THE COURT: WELL, IT'S NOT SO MUCH THAT I CARE ABOUT ME BEING CHALLENGED. I MEAN I WOULD LIKE TO KNOW WHERE THE F.C.C.'S INTERPRETATION IS IN ERROR, AND WHY I SHOULD NOT FOLLOW WHAT I BELIEVE THEY HAVE SAID. SO ...

MR. DEUTSCH: OKAY. SHALL I PROCEED?

THE COURT: YES, YOU SHALL.

BY MR. DEUTSCH:

Q. NOW, MR. BIBY, IF YOUR TASK WAS TO DETERMINE WHETHER OR NOT A HOMEOWNER RECEIVED A GRADE B SIGNAL AT THEIR ROOFTOP ANTENNA LOCATION BY MEASUREMENT --

A. YES.

Q. -- WOULD IT BE BETTER TO MEASURE ON THE ROOF WHERE THE ANTENNA IS OR BETTER TO MEASURE ON A PUBLIC ROAD SOME UNKNOWN DISTANCE AWAY IN ORDER TO DETERMINE THE SIGNAL AT

THE ROOFTOP THAT COULD BE RECEIVED BY THE HOMEOWNER'S ROOFTOP ANTENNA?

A. IT WOULD BE CLEARLY BETTER TO DETERMINE THE SIGNAL STRENGTH AT THE ROOFTOP.

Q. IS IT PRACTICAL TO PUT A TEST ANTENNA OF KNOWN CHARACTERISTICS ON EVERY HOMEOWNER'S ROOFTOP TO TEST THE SIGNAL THERE?

A. IF I UNDERSTAND THAT THE ORDER OF MAGNITUDE OF PRIMETIME 24'S SUBSCRIBERS IS IN THE MILLIONS, SO THAT WOULD SEEM TO ME TO BE TOO GREAT A BURDEN.

Q. NOW, WOULD IT BE FAIR THEN TO SAY THAT THE ALTERNATIVES PRESENTED ARE TO PLACE A TEST ANTENNA OF KNOWN CHARACTERISTICS SOMEWHERE ELSE OR TO USE THE HOMEOWNER'S ANTENNA AT THE PROPER LOCATION?

A. THERE'S AN ENGLISH WORD THAT I HAVE TROUBLE WITH. IS IT "CONUNDRUM"? I CAN'T RESOLVE THAT QUESTION FOR YOU.

Q. DO BOTH APPROACHES INTRODUCE ERRORS IN DETERMINING THE TRUE SIGNAL?

A. INTRODUCE AT LEAST UNKNOWNS.

Q. NOW, IF ONE CHOOSES TO ATTEMPT THE METHOD OF MAKING A DETERMINATION AT THE CORRECT LOCATION AT THE HOMEOWNER'S ROOF USING THE HOMEOWNER'S ANTENNA, IS IT POSSIBLE, ALTHOUGH THE HOMEOWNER'S ANTENNA INTRODUCES UNCERTAINTY, TO INFER WHETHER OR NOT A GRADE B SIGNAL INTENSITY IS PRESENT FROM THE SIGNAL MEASUREMENT?

A. I AM ASSUMING YOU MEAN AT THE LOCATION OF THE RECEIVER USING THE HOMEOWNER'S ANTENNA AND TRANSMISSION LINE.

Q. CORRECT.

A. AND THE QUESTION WAS WAS IT POSSIBLE TO MAKE A REASONABLE INFERENCE.

Q. CORRECT.

A. YES, IT IS.

Q. AND CAN YOU ESTIMATE -- WELL, HOW ACCURATELY CAN THIS BE DONE?

A. THERE SEEMS TO BE AN IMPRESSION HERE THAT THE SIGNAL IS ROCK STEADY, AND IT ISN'T. THE SIGNAL AS RECEIVED, IN GENERAL, AT ANY GIVEN LOCATION, FLUTTERS, VARIES RAPIDLY, AS I WAS TRYING TO EXPRESS EARLIER.

I WOULD STATE THAT AN EXPERT WITH KNOWLEDGE OF TYPICAL TELEVISION RECEIVING ANTENNAS AND KNOWLEDGE OF THE CHARACTERISTICS OF TRANSMISSION LINES, ET CETERA, COULD PROBABLY ESTIMATE THE CHARACTERISTICS OF THE PARAMETERS, IF YOU WOULD, OF SUCH THINGS AS ANTENNA GAIN, TRANSMISSION LINE LOSS, THE IMPORTANT FACTORS, ABOUT AS ACCURATELY AS YOU CAN ACTUALLY MEASURE THE SIGNAL.

Q. NOW, ASSUME ONE IS INTERESTED IN DETERMINING WHETHER OR NOT THIS GRADE B SIGNAL INTENSITY, AS THE F.C.C. DEFINES IT, EXISTS AT THAT LOCATION ABOVE THE ROOF, BUT THAT ONE IS INTERESTED IN TRYING TO INFER FROM A PREDICTION INSTEAD OF MEASUREMENT.

A. I'M NOT SURE I UNDERSTAND YOUR STATEMENT.
Q. I'D LIKE TO TURN FROM MEASUREMENT TO PREDICTION.
A. YES.
Q. AND IS THAT AN ALTERNATIVE WAY OF ESTIMATING THE SIGNAL STRENGTH ABOVE A HOMEOWNER'S ROOFTOP?
A. I UNDERSTAND.
Q. NOW, WE HAVE TALKED ABOUT, HAVE WE NOT, THE LONGLEY-RICE MODEL AS A PREDICTED METHODOLOGY.
A. WE HAVE.
Q. DO YOU BELIEVE THAT SOME PREDICTIVE METHODOLOGY COULD BE AN ALTERNATIVE TO MEASUREMENT IN DETERMINING SIGNAL STRENGTH UNDER THE SATELLITE HOME VIEWER ACT FOR A HOMEOWNER'S LOCATION?
A. TO A REASONABLE DEGREE OF CERTAINTY, YES.
Q. DO YOU BELIEVE THAT THE LONGLEY-RICE MODEL, AS IT NOW EXISTS, CAN SERVE THAT FUNCTION?
A. WITH MUCH MORE PROOF DATA, THE TECHNICAL TERM IS GROUND TRUTH DATA, SPECIFICALLY REGARDING RECEPTION AT ROOFTOP LEVEL OF TELEVISION SIGNALS, THE PERFORMANCE OF THE MODEL COULD BE SIGNIFICANTLY IMPROVED OVER WHAT IT IS NOW.
Q. BASED ON WHAT IT IS NOW, IN YOUR OPINION, IS IT AN ACCEPTABLE TECHNIQUE AND A TECHNIQUE YOU WOULD PROPOUND BEING USED IN THE METHOD THAT JULES COHEN USED IT?
A. JULES COHEN USED WHAT -- USED A -- I'M GOING TO CALL IT A BARE BONES VERSION OF LONGLEY-RICE -- IN THE INDUSTRY,

IT'S KNOWN AS VERSION 1.2.2 -- WHICH DID NOT TAKE INTO ACCOUNT WHAT, IN MY VIEW, IS AN EXTREMELY IMPORTANT FACTOR, THAT BEING THE EFFECTS OF BUILDINGS AND VEGETATION CLUTTER.

SO I BELIEVE THE QUESTION BEFORE ME IS DO I FEEL THAT LONGLEY-RICE, AS USED BY JULES COHEN, IS A RELIABLE PREDICTIVE TOOL? MY ANSWER IS NO, I DO NOT.

Q. THANK YOU.

NOW, FOR LONGLEY-RICE PROBABILITY MAPS OF THE KIND THAT MR. COHEN PRESENTED, ARE THE CALCULATIONS ON WHICH THE COLORING OF THOSE MAPS ARE BASED DONE BASED UPON CALCULATIONS OF SINGLE POINTS INSIDE CELLS?

A. THAT'S MY UNDERSTANDING FROM HIS TESTIMONY.

Q. WOULD THE ENTIRE CELL ASSIGNED THE SAME RESULT AS THE ONE CALCULATION POINT THAT'S MADE IN THE CELL?

A. MY INTERPRETATION OF YOUR TERM "CELL" IS THE RECTANGLE TO WHICH MR. COHEN ALLUDED, HE CHARACTERIZES AS BEING ROUGHLY 800 METERS ON A SIDE. WITH THAT INTERPRETATION, YES, IT'S MY UNDERSTANDING THAT ONLY A SINGLE PREDICTION WAS DONE IN EACH SUCH CELL.

Q. MR. BIBY, IF YOU -- AM I HEARD -- IF ONE LOOKS AT THIS SKETCH AS DIVIDING AN AREA INTO CELLS WITH THESE DASHED HORIZONTAL AND VERTICAL LINES DEFINING THE BOUNDARIES OF THE CELL, AND IF ONE LOOKS AT THESE DOTS IN THE MIDDLE OF THE CELLS AS POINTS WHERE THE CALCULATIONS ARE MADE, IS THAT A CORRECT PICTURE OF THE GEOMETRY AS YOU UNDERSTAND IT,

GENERALLY, THAT WAS FOLLOWED IN THOSE JULES COHEN MAPS?

A. YES.

Q. AND THE DISTANCE BETWEEN TWO MEASUREMENTS WAS ON THE ORDER OF 800 METERS OR EIGHT-TENTHS OF A KILOMETER?

A. CORRECT.

Q. NOW, MR. BIBY, DO I ALSO UNDERSTAND CORRECTLY THAT THE CALCULATION MADE AT THE CENTER OF EACH CELL WAS THEN THE RESULT ASSIGNED TO THE ENTIRE AREA WITHIN THE CELL?

A. THAT'S MY UNDERSTANDING OF MR. COHEN'S TESTIMONY, YES.

Q. IN FACT, WOULD IT BE POSSIBLE FOR THERE TO BE A VARIATION SUCH THAT ALTHOUGH THE CENTER OF THE CELL WAS ABOVE GRADE B, OTHER AREAS IN THE CELL, IN FACT, WERE BELOW GRADE B?

A. I BELIEVE YOU USED THE WORD "POSSIBLY." I CAN VIRTUALLY GUARANTEE THAT THAT WOULD BE THE CASE BECAUSE THE LOCATION VARIABILITY THAT WE HAVE DISCUSSED.

Q. SO THAT EVEN THOUGH MR. COHEN'S MAPS ARE SHOWN WITH CELLS ENTIRELY COLORED YELLOW, IS IT YOUR TESTIMONY THEN THAT THERE WOULD, IN FACT, BE WITHIN THE CELLS AREAS OF WHITE, THAT IS TO SAY, AREAS WHERE THE SIGNAL WOULD BE BELOW GRADE B INTENSITY?

A. CORRECT.

Q. NOW, IF WE ASSUME HOUSES ARE SPACED A HUNDRED FEET APART, CAN YOU TELL ME HOW MANY HOUSES WOULD FIT AROUND THE EDGE OF THE PARAMETER OF ONE OF THOSE CELLS THAT MR. COHEN

GRADE B.

Q. NOW, IN YOUR EXPERIENCE AS AN ENGINEER, BY HOW MUCH CAN A SIGNAL VARY OVER THE DISTANCE BETWEEN CALCULATIONS AS DONE BY MR. COHEN? THAT IS, HOW MUCH CAN A SIGNAL VARY OVER EIGHT-TENTHS OF A KILOMETER?

A. IN MY FORMAL WRITTEN FILINGS, I DISCUSSED THE PROBABLE EXTENT OF LOCATION VARIABILITY RATHER EXTENSIVELY. AND IT DOES DEPEND ON FREQUENCY, CHANNEL, TERRAIN ROUGHNESS, THE TYPE OF VEGETATION, TYPE OF HOUSING CLUTTER. I CAN GIVE YOU VERY GENERAL GUESSES. USUALLY ON THE ORDER OF 20 DECIBELS.

Q. NOW, WE'VE DISCUSSED HERE LOCATIONAL VARIABILITY, THE UNCERTAINTY ABOUT SIGNAL STRENGTH AT A PARTICULAR LOCATION AWAY FROM WHERE THE LOCATION IS OR AS ONE MOVES. I WANT TO ASK YOU A QUESTION NOW ABOUT TEMPORAL VARIABILITY AS IT RELATES TO THESE MAPS.

DO YOU RECALL MR. COHEN ACKNOWLEDGING THAT AT A LOCATION WHERE THERE WAS A 90 PERCENT LIKELIHOOD OF RECEIVING A SIGNAL OF GRADE B OR GREATER THAT THE VIEWER WOULD BE UNABLE TO GET THE SATISFACTORY SIGNAL TEN PERCENT OF THE TIME, THAT IS, 2.4 HOURS IN 24? DO YOU RECALL THAT TESTIMONY?

A. I RECALL THE TESTIMONY REGARDING TEN PERCENT. I DON'T RECALL IF MR. COHEN REALLY SAID 2.4 HOURS OUT OF 24. I'VE KNOWN MR. COHEN FOR 30 YEARS, AND I KNOW THAT HE KNOWS THESE VARIATIONS MAY SPAN LONGER TIME PERIODS THAN 24 HOURS. SO

A. NO. I BELIEVE MR. COHEN'S MAPS WERE NOT APPROPRIATE FOR THAT PURPOSE.

Q. NOW, WHAT I'D LIKE YOU TO DO IS ENUMERATE FOR US, IF YOU COULD, THE -- WHATEVER NUMBER OF SHORTCOMINGS YOU BELIEVE THE MAPS HAVE AND THE MANNER IN WHICH HE USED THEM.

A. IF YOU WILL PARDON ME FOR REFERRING TO SOME NOTES, I AM NOT GOOD AT REMEMBERING A NUMBER OF ITEMS. BUT THE FIRST ITEM THAT COMES TO MIND IS MR. COHEN'S MAPPINGS DID NOT CONSIDER THE POSSIBILITY OF INTERFERENCE TO THE SIGNAL. THIS IS PARTICULARLY IMPORTANT IN THOSE CASES WHICH WERE FREQUENT AMONG HIS MAPS SET WHERE HIS DEPICTED GRADE B SIGNALS WENT FAR BEYOND THE F.C.C.'S GRADE B CONTOUR.

AND AS I HAVE DISCUSSED, MANY, I WOULD EVEN SAY MOST OF THE CHANNEL ASSIGNMENTS WERE PURPOSELY SO STRUCTURED AS TO PERMIT INTERFERENCE UP TO TANGENTIAL, TO THE GRADE B CONTOUR. SO HIS FAILURE TO CONSIDER INTERFERENCE FROM OTHER TELEVISION STATIONS CONCERNS ME GREATLY.

Q. OKAY. COULD YOU TELL US WHAT THE NEXT OF THE ELEMENTS THAT YOU BELIEVE CONCERN YOUR --

A. WELL, HE FAILED TO CONSIDER LOCATION VARIABILITY WHEN HE PUT IN THE 50 PERCENT LOCATION PARAMETER, THAT IS TO SAY, TO THE COMPUTER PROGRAM, IGNORE LOCATION VARIABILITY.

THE SAME COMMENT GOES TO TEMPORAL OR TIME VARIABILITY, HE INSTRUCTED THE PROGRAM TO IGNORE THAT FACTOR.

HE DID NOT TAKE INTO ACCOUNT THE EFFECTS OF TREES AND BUILDINGS UPON THE SIGNAL, EVEN THOUGH THOSE THINGS -- THE TECH -- OR THE TERM FOR BUILDINGS AND VEGETATION IS MORPHOLOGY. IT HAS BEEN KNOWN SINCE THE EARLY DAYS OF THE USE OF RADIO WAVES THAT MORPHOLOGY HAS A SIGNIFICANT EFFECT, OR CAN HAVE A SIGNIFICANT EFFECT, ON THE RECEIVED STRENGTH OF SIGNALS.

AND LAST AND LEAST ON THE ORDER OF IMPORTANCE IS MR. COHEN USED A 30-FOOT ANTENNA HEIGHT. AND IT APPEARS TO ME THE INTENT OF THE ACT IS TO USE A HEIGHT OF PERHAPS FIVE FEET ABOVE THE HOUSEHOLDER'S ROOFTOP.

Q. OKAY. I WOULD LIKE TO GO BACK TO THE ELEMENTS THAT YOU HAVE LAID OUT NOW A LITTLE BIT.

YOU'VE TALKED ALREADY ABOUT INTERFERENCE AND I'M NOT GOING TO DWELL ON THAT. YOU'VE ALSO TALKED SOMEWHAT ABOUT LOCATIONAL VARIABILITY, IN FACT, THAT MR. COHEN UTILIZED 50 PERCENT. AND I DON'T, IN THE INTERESTS OF TIME, I DON'T WANT YOU TO REPEAT WHAT YOU'VE SAID ABOUT THAT THUS FAR.

BUT LET ME ASK, IF I UNDERSTAND CORRECTLY, THAT AS YOU UNDERSTAND IT, MR. COHEN, BY NOT INVOKING THE LOCATION VARIABILITY PARAMETERS IN THE PROGRAM, USED A 50 PERCENT LIKELIHOOD OF -- OR 50 PERCENT LIKELIHOOD, IN EFFECT. AND, THEREFORE, THAT IF ONE RETURNS TO THE THEORETICAL 100 HOMES THAT ARE IN A CELL WHERE PREDICTION IS MADE, MR. COHEN,

A. I BELIEVE SHE DOES. I CAN QUOTE A SINGLE STATEMENT.
Q. WOULD YOU?
A. SHE SAYS:

"THE PROBLEMS ENCOUNTERED IN PROPAGATION IN AN URBAN ENVIRONMENT CONTAIN TOO MANY UNKNOWN ELEMENTS FOR A COMPLETE THEORETICAL MODELING."

Q. CAN YOU TELL US WHAT "MULTIPATH FADING" IS?
A. WELL, WHAT "MULTIPATH FADING" IS?
Q. YES.
A. IN A NUTSHELL, IT'S THAT WILDLY VARIABLE SIGNAL THAT I TRIED TO SKETCH EARLIER.
Q. DOES MISS LONGLEY HAVE ANY OBSERVATIONS ABOUT MULTIPATH FADING IN AN URBAN ENVIRONMENT? AND I DIRECT YOUR ATTENTION AGAIN TO PAGE THREE.
A. LET'S SEE.
Q. AND THE BEGINNING OF THE FIRST FULL PARAGRAPH.
A. YES. THE LAST SENTENCE IN THE FIRST PARAGRAPH, FULL PARAGRAPH IS, I QUOTE:

"THIS MULTIPATH INTERFERENCE CAUSES THE SIGNAL TO FADE RAPIDLY AND DEEPLY AND CAN BE A SERIOUS PROBLEM IN A HIGHLY BUILT-UP AREA WHERE A LARGE NUMBER OF PROPAGATION PATHS MAY BE FORMED."

Q. AND DOES SHE REFER TO A 30 D.B. LOSS AS BEING QUITE COMMON?
A. (NO RESPONSE.)

Q. AND I'M LOOKING AT THE TOP OF PAGE -- THE FIRST FULL PARAGRAPH ON PAGE THREE.
A. THANK YOU. BECAUSE I WAS PRETTY SURE SHE DID, I DIDN'T REMEMBER WHERE.
THE COURT: SECOND SENTENCE, FIRST PARAGRAPH.
THE WITNESS: OKAY.
THE COURT: PAGE THREE.
THE WITNESS: "MANY INVESTIGATORS HAVE STUDIED MULTIPATH FADING"?
THE COURT: NO, JUST ABOVE THAT.
THE WITNESS: OH, I'M SORRY.
A. "A SERIOUS PROBLEM IN URBAN PROPAGATION IS THE MULTIPATH INTERFERENCE WHICH CAUSES THE RADIO SIGNAL TO FADE RAPIDLY AND DEEPLY WITH DEPTHS OF 30 D.B. BEING QUITE COMMON."
Q. THANK YOU.
NOW, HAVE YOU DONE WORK ON THE SUBJECT -- BY THE WAY, DOES MS. LONGLEY EXPRESS SIMILAR OBSERVATIONS ABOUT THE EFFECTS OF VEGETATION ON SIGNALS?
A. YES. IN A SEPARATE PAPER, SHE ANALYZED THE LITERATURE EXTENSIVELY AND PUT FORTH SOME CONCLUSIONS OF HER OWN.
Q. HAVE YOU DONE PROFESSIONAL WORK ON THE SUBJECT IN THE PAST BEFORE YOU WERE RETAINED TO WORK IN THIS CASE?
A. YES, EXTENSIVELY.
Q. WHAT DID YOU DO?

A. WELL, I REALIZED EARLY ON THAT THE -- I'M GONNA CALL IT THE BARE BONES LONGLEY-RICE PROGRAM -- THOUGH PARTICULARLY TEN, 15 YEARS WHEN I FIRST STARTED THIS WORK, I REALIZED IT WAS THE BEST THING WE HAD AVAILABLE. BUT IT HAD THE SHORTCOMINGS THAT IT SIMPLY DID NOT TAKE THE EFFECTS OF MORPHOLOGY INTO ACCOUNT.

I BELIEVE YOU ASKED WHAT DID I DO.

Q. YES.

A. I REALIZED THAT I NEEDED DATA ON WHICH TO TRY TO CORRELATE THE EFFECTS OF IDENTIFIABLE MORPHOLOGY CHARACTERISTICS TO THE EFFECTS ON RADIO WAVES. SO AT MY OWN EXPENSE, I PUT TOGETHER A MEASUREMENT PACKAGE AND PERFORMED EXTENSIVE MEASUREMENTS ON AS MANY FREQUENCIES AND ON AS MANY ENVIRONMENTS, FRANKLY, AS I COULD AFFORD; STUDIED THAT DATA EXTENSIVELY; AND FROM THAT ANALYSIS CREATED A FORMULA, IF YOU WOULD, OR A SERIES OF FORMULAS, TO DESCRIBE IN NUMERICAL TERMS THESE EFFECTS.

Q. AND, THUS, TO IMPROVE UPON THE BARE BONES LONGLEY-RICE MODEL?

A. I BELIEVE, YES, AND SIGNIFICANTLY SO.

Q. AND IS YOUR ADAPTATION USED?

A. IT'S WIDELY USED.

Q. HOW LARGE A CORRECTION CAN YOUR IMPROVEMENTS MAKE TO THE LONGLEY-RICE MODEL BY INTRODUCING THE EFFECTS OF VEGETATION AND BUILDINGS?

A. REALIZE THAT THE USE OF MY VERSION OF LONGLEY-RICE IS NOT RESTRICTED TO TELEVISION AND F.M. BROADCAST. EXTENSIVE USE HAS BEEN MADE BY THE PUBLIC SAFETY COMMUNITY THAT USES A VARIETY OF FREQUENCIES, MANY OF WHICH ARE HIGHER THAN MOST TELEVISION; AND ALSO THE CELLULAR BUSINESS, WHICH USES FREQUENCIES ABOVE THE U.H.F. T.V. BAND. REALIZING THAT BROAD SPECTRUM OF APPLICATIONS, I BELIEVE 32 DECIBELS IS A CORRECTION FACTOR AT CELLULAR FREQUENCIES FOR A DENSE PINE WOOD. THAT'S A FACTOR OF MORE THAN A THOUSAND TO ONE, IN TERMS OF EQUIVALENT SIGNAL LOSS.

Q. DO YOU HAVE ANY ESTIMATES OF THE ATTENUATION OR SIGNAL LOSS AT TELEVISION BROADCAST FREQUENCIES?

A. DISTINGUISHING THE FACT THAT LOSS, MEANING THE MEDIAN LOSS OF SIGNAL STRENGTH, NOT DISCUSSING FOR THE MOMENT THE VARIABILITY CREATED BY THE MORPHOLOGY, I WOULD ESTIMATE THAT AT LOW V.H.F. CHANNEL 2, TYPICAL URBAN ENVIRONMENT WITH A LOT OF SHADE TREES, YOU'RE ON THE ORDER OF 12 DECIBELS. AND AT THE UPPER END OF THE U.H.F. SPECTRUM IN PINEY WOODS, YOU'RE GETTING UP TO THE UPWARD 32 DECIBELS THAT I MENTIONED A MINUTE AGO.

Q. OKAY. AND DO YOU RECALL MR. COHEN SAYING THAT HE AGREED THAT IF ONE COULD TAKE INTO ACCOUNT BUILDINGS AND VEGETATION, THAT WOULD BE PREFERABLE TO NOT DOING SO?

A. I DO.

Q. NOW, LAST, BEFORE WE MOVE TO THE WORK THAT YOU

PREDICTIONS. SO IN THE COMPOSITE, THEY APPEAR TO BE DEPICTING AN AREA; BUT JUST AS MR. COHEN DID, I HAVE LITTLE DOTS FOR EACH INDIVIDUAL LITTLE CELL, AS YOU CALLED IT.

Q. OKAY. WHAT DO YOU CONCLUDE, BASED UPON YOUR COMPARISON OF THE TWO MAPS GENERATED FOR THE VERY SAME STATION BY MODIFYING THE INPUT PARAMETERS IN THE PROBABILISTIC CALCULATION?

A. I BELIEVE THAT MY DEPICTION IS AN ENORMOUS STEP IN THE CORRECT DIRECTION.

AND INTERESTINGLY ENOUGH, I DO LIVE AT 4900 NORTH 16TH STREET IN A DIFFICULT RECEPTION AREA. AND LO AND BEHOLD, THAT LITTLE AREA SHOWS UP ON THE LEFT-HAND MAP UP THERE.

THE COURT: WHAT DO YOU MEAN "CORRECT DIRECTION"?

THE WITNESS: I WOULD NOT STATE THAT I AM ABSOLUTELY CORRECT, THAT EVERYTHING I HAVE DONE IS THE ONLY RIGHT WAY. I, I FEEL THAT MY MAPS ARE PROBABLY AS ACCURATE A PREDICTION OF THE REALITY AS ANYONE IN THIS PROPAGATION OR SIGNAL PREDICTION BUSINESS CAN DO. BUT I'M NOT ASSERTING THAT THEY'RE PERFECT; THEY ARE THE BEST THAT ANYONE CAN DO.

THE COURT: THE BEST REASONED CONCLUSION YOU CAN REACH BASED UPON ALL THAT YOU KNOW IN YOUR EXPERIENCE.

THE WITNESS: YES, MA'AM.

THE COURT: EXCUSE ME.

THE WITNESS: YES, YOUR HONOR.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
SOUTHERN DIVISION

CBS, INC.; FOX BROADCASTING CO.; GROUP W/CBS TELEVISION STATIONS PARTNERS; CBS TELEVISION AFFILIATES ASSOCIATION; POST-NEWSWEEK STATIONS FLORIDA, INC.; KFAX COMMUNICATIONS, INC.; LWWI BROADCASTING, INC.; AND RETLAW ENTERPRISES, INC., Plaintiffs, vs. PRIMETIME 24 JOINT VENTURE, Defendant.	Case No. 96-3650-Civ-Nesbitt Magistrate Judge Johnson (Order of Reference March 18, 1997)

AFFIDAVIT OF RICHARD L. BIBY

I, Richard L. Biby, declare under penalty of perjury that:

1. I am executing and submitting this Affidavit in support of Defendant PrimeTime 24 Joint Venture's Motion for Clarification filed in the above-captioned case.

2. Attached hereto as Exhibit 1 is my initial Expert Report herein. That Report sets forth my expert qualifications and comments upon the shortcomings of the Longley-Rice maps previously prepared by Plaintiffs' expert herein, Jules Cohen.

3. Attached hereto as Exhibit 2 is my supplemental Rebuttal Expert Report herein, including as Exhibits A and B two maps. Those maps illustrate the profound effect, upon the results of a Longley-Rice propagation analysis and map, of changing just three underlying assumptions.

4. As discussed in my two Reports, the Longley-Rice maps utilized by Plaintiffs are profoundly flawed and misleading, for three fundamental reasons.

5. First, the Plaintiffs' maps are based upon an assumption that receiving antennas will be located 30' in the air. But the SHVA language is that a household is ineligible if it is capable of receiving a signal of Grade B intensity with a conventional rooftop antenna. In many areas of the country, houses are predominately one story high. When conventional antennas are placed upon the roofs of such homes, they typically are approximately 20', not 30', in the air. But signal strength generally decreases rapidly as one moves downward from 30' to 20' above ground. Hence, Plaintiffs' maps - which demonstrate predicted signal strength at 30' - systematically overestimate signal strength that could be received by a household.

6. Second, the Plaintiffs' maps do not take into account the improvements to the original Longley-Rice model which I developed to take into account the effects of vegetation and

buildings upon signal propagation. My Reports submitted herein set forth the need for such a correction and describe how I developed an algorithm to provide it. Plaintiffs' maps, however, fail to make such a correction; they therefore are inaccurate.

7. Finally, as described in my Reports, Plaintiffs' maps are fundamentally misleading for a third and most serious reason. The Longley-Rice model is probabilistic. It does not purport to determine with absolute certainty the signal strength that can be received at any particular location. Rather, it predicts a median path loss. The predicted path loss, adjusted by the effective radiated power (ERP), yields the median predicted signal strength. The predicted median signal strength values can be adjusted to account for time and location variability. Thus, one can use the model to predict, for any particular probability, the area within which a specified signal strength (such as the Television Grade B) can be received with that probability or higher. In other words, given a 90% probability (along with other necessary data such as radiated power, frequency, a numerical value representing a Grade B signal strength, and so on), the model can provide calculated signal strength values that can be used to create a map showing the area within which a Grade B signal is likely to be received at 90% of the locations.

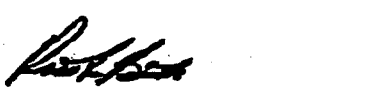
The maps Plaintiffs have supplied to the Court are all based upon a 50% locational probability; that is, they illustrate the areas within which there is a 50% probability of receiving a Grade B signal. As described in my reports, however, that is a misleading and inappropriate probability figure to utilize for SHVA purposes in this litigation. The reason is that, by definition, an area calculated using a 50% locational probability shows areas where there is a 50% probability that a signal of Grade B intensity *cannot* be received. At such locations, households would be eligible for PrimeTime 24 service. PrimeTime 24 reaches only approximately 3% of television households. Thus, a fairer map would illustrate locations where there was a 3% probability of receiving a signal of less than Grade B intensity - or a 97% probability of receiving a signal of Grade B intensity or greater.

8. Exhibit B to my rebuttal Report illustrates the dramatic impact of using a 97% probability as a cutoff, rather than 50%, using a 20' antenna height rather than 30', and applying a morphological correction to take vegetation and buildings into account, for one particular television station. The effect is dramatic; many subscribers who would be ineligible under Plaintiffs maps are clearly eligible under these maps.

9. Similar maps could be prepared for all other television markets; they would reveal similar dramatic differences from the maps proffered by Plaintiffs.

It follows that the Court must consider carefully what parameters should be utilized in signal strength predictions that are to be used as the basis for an injunction denying service to households on the basis of their geographical location alone. In particular, the Court should specify that the maps are to be based upon a receiving antenna height of 20', the application or morphological corrections for the effects of buildings and vegetation upon received signal strengths, and the specification of a 97% probability, not a 50% probability.

I declare under penalty of perjury that the foregoing is true and correct.



Richard L. Biby
May 27, 1998

EXPERT REPORT OF RICHARD L. BIBY

ON BEHALF OF PrimeTime 24 JOINT VENTURE

This report sets forth the opinions to which I am prepared to testify in the matter of CBS Inc., et al., Plaintiffs, v. PrimeTime 24 Joint Venture, Defendant, regarding whether PrimeTime 24 is violating the requirements of the Satellite Home Viewer Act.

My name is Richard L. Biby. I received a Master of Electrical Engineering Degree from the University of Illinois ("Illinois") in 1962. During my undergraduate years at Illinois, I was elected to the Electrical Engineering Honorary, Eta Kappa Nu. I am a Registered Professional Engineer in the District of Columbia, where I have testified extensively at the Federal Communications Commission ("FCC") and in the Commonwealth of Virginia, the location of both my residence and my office. I am a past President of the Association of Federal Communications Consulting Engineers ("AFCCE").

In January, 1983, I started the consulting engineering firm of Richard L. Biby, Communications Engineering Services, P.C. ("CES"). I have been involved in the management and operation of the firm on a daily basis since that time. Over the years, CES has provided consulting services to a wide variety of clients, including the

National Association of Broadcasters ("NAB"), the Association for Maximum Service Telecasters ("AMST"), numerous telephone companies, including American Telephone and Telegraph Company ("AT&T"), Bell South, Bell Atlantic, GTE and Contel, applicants for and operators of hundreds of cellular radiotelephone systems, and numerous broadcasters and other users of the radio spectrum. I hold a design patent for a new class of standard broadcast transmitting antenna and have presented papers on that subject and on television spectrum management at annual conventions of the National Association of Broadcasters.

My other experience that is pertinent to this proceeding includes the formation of two companies, DataWorld, Inc. and Communications Data Services, Inc. ("CDS"), which, together, provide the bulk of professional computational and data services to consultants in the radio communications engineering field in this country.

At DataWorld, I designed and implemented the first commercially successful FM and Television Broadcast databases.

At CDS, I designed and implemented the terrain and morphology databases that remain the standard of comparison in their areas. Acting on the availability of necessary resource data (i.e., terrain and morphology), I implemented a computer program, based on the widely-used ITS Irregular

Terrain Model (often called "the Longley-Rice Model"). Recognizing that the basic Longley-Rice Model does not consider the effects of buildings and vegetation ("morphology") upon radio waves, I collected signal strength data at a variety of frequencies and in numerous environments, on which basis I designed and implemented a computational algorithm to adjust the Longley-Rice predictions to the realities of the observed data.

My implementation of the Longley-Rice Model is widely used in both the broadcast and the mobile radio services.

I also completed nationwide spectrum packing studies for the National Association of Broadcasters and for the Association for Maximum Service Telecasters. These studies were designed to maximize availability of FM and High-Definition Television channels, respectively, throughout the United States, subject to an array of definable constraints regarding interference and station distance separation parameters.

I have testified or been deposed in the following matters within the past four years: Contel Cellular of California, Inc./Sierra Arbitration and Telephone and Data Systems, Inc. (9 FCC Record 938 (1994). I have also testified at various times before zoning boards and utilities commissions.

I have agreed to provide my services in this matter at an hourly billing rate of $200.00 plus reimbursement of out-of-pocket expenses such as travel, exhibit preparation, etc.

I have reviewed the March 8, 1997, statement prepared by Jules Cohen, PE ("Mr. Cohen") on behalf of CBS Inc., et al., Plaintiffs. Therein, Mr. Cohen presents a summary overview of "maps and actual signal intensity testing — designed to assess whether, and to what extent, PrimeTime 24 is violating the requirements of the Satellite Home Viewer Act ("SHVA" or "the Act")."

SHVA authorizes satellite carriers, such as PrimeTime 24, to deliver distant network stations to satellite dish owners for private home viewing, but only to "unserved households", which SHVA defines (in relevant part) as being those that cannot receive, through the use of a conventional outdoor rooftop receiving antenna, an over-the-air signal of Grade B intensity (as defined by the Federal Communications Commission) from a primary network station affiliated with that network.

Mr. Cohen's statement presents a number of predicted signal strength maps for stations around the country. The maps depict the individual station Grade A and Grade B signal strength contours as predicted by the FCC's method (as detailed in Section 73.684 of the FCC Rules) and the results of a Longley-Rice analysis of the station's

predicted signal intensity. I believe that Mr. Cohen's Longley-Rice predictions are flawed because, among other things, they do not consider location variability, time variability, or the effects of buildings and vegetation on the received signal strength.

I understand that Mr. Cohen's maps are based on predictions of the median signal strength, at 30 feet in the air, at 50% of the locations 50% of the time.

At the locus of points along the perimeter of the area(s) depicted by the Cohen maps as receiving predicted Grade B or greater signal strength, such a signal would be present at only 50% of the locations and only 50% of the time.

One can determine the areas within which a higher percentage of locations would receive a Grade B or greater signal a higher percentage of the time by increasing the predicted median signal strength.

(Signal strength (intensity) values are expressed as decibels ("dB") relative to some stated reference value, such as one MicroVolt per meter ("dBuV" or, more correctly, "dBuV/m") with the implicit assumption that free-space conditions apply. A decibel value is ten times the (base 10) logarithm of the ratio of a particular value to some stated reference power.)

Within the communications industry, it is generally accepted that both the location variability and the time variability of a broadcast signal have a log normal distribution; that is to say, the variation of signal strength, expressed in dBuV, follows a normal distribution.

Once the standard deviations (or "sigma") of these two normal signal strength distributions are known, it is possible to determine the increase in signal strength that is required in order to predict that some percentage, greater than 50 percent, of all possible receiving locations will receive the stated signal strength or more some percentage of the time greater than 50 percent.

Ms. Anita Longley, co-author of the Longley-Rice model, published a formula for location variability, as a function of terrain roughness and wavelength ("Location Variability Of Transmission Loss--Land Mobile And Broadcast Systems", OT Report 76-87 and reiterated in "Radio Propagation in Urban Areas", OT Report 78-144.) For randomly located receiving antennas in smooth to slightly hilly terrain, the Longley formula is expressed as:

$$O_L = 5.0 * \log(freq\_mhz) - 1.0 \text{ dB}$$

This formula evaluates to approximately 8.3 dB for low-VHF frequencies (Channels 2-6), 10.5 dB for high-VHF (Channels 7-13), and 13.0 dB at 638 MHz, the mid-point of UHF Channels 14-69.

My reasoning regarding the probability that there will be a Grade B or better signal at roof-top level at any given location is as follows: I have been informed that the number of PrimeTime 24 subscribers in the United States is no more than about three percent (3%) of the television households. Thus, it is appropriate to consider the 97th percentile probability of reception, not the median (50th percentile) case. In order to arrive at the 97th percentile, for example, it is necessary to add approximately 2.2 sigma to the median predicated signal strength value. Doing so ensures that at least 97% of the locations within the area in question will receive the predicted signal strength or greater, which is to say that fewer than 3% will receive a weaker-than-predicted signal.

In order to estimate the difference between 50% and 90% time availability, one can first determine the difference between the field strength predicted by the FCC's 50-50 percentile graphs and the corresponding 50-10 percentile graphs, as set forth in Section 73.699 of the FCC Rules. For typical distances to the Grade B signal strength, as depicted on Cohen's maps (120 km or so), and typical transmitting antenna heights (300 meters or so), the difference between the 50-50 and 50-10 graphs is on the order of 9 to 11 dB, for an average of about 10 dB. Since the time variability, in common with the location

variability, follows a log normal distribution (which is symmetrical about the median), it follows that an upward adjustment of approximately 10 dB is needed to increase the time availability from 50% to 90%. This is an increase of about 1.64 sigma, from which one can determine that sigma is about 6.1 dB. In order to increase the time availability to 97% the factor is about 2.2 sigma, as was also discussed earlier. To ensure 97% time availability, it is necessary to increase the 50 percent estimates by about 13.4 dB.

The approximate required median signal strength values required to ensure that 97-97 percentile location and time availability are set forth in the table, below:

Channels	Grade B (dBuV)	Location dB	Time dB	Required dBuV
2 - 6	47	18.3	13.4	79
7 - 13	56	23.1	13.4	93
14 - 69	64	28.6	13.4	106

The above tabulation illustrates the order of magnitude of the factors that Mr. Cohen should have considered in his use of the Longley-Rice model. In actuality, such adjustments should have been made for each location at which the model made a signal strength prediction.

Moreover, Mr. Cohen should have calculated those signal intensity probabilities at the rooftop height the SHVA specifies, not at 30 feet in the air.

There is yet another problem of a statistical nature in Mr. Cohen's use of the Longley-Rice model. To the best of my knowledge, the performance of this model has never been verified under the operational conditions of residential roof-top reception of television broadcast signals. I can testify, based on my own experience and on reports published by the Institute of Electrical and Electronics Engineers (IEEE Transactions on Vehicular Technology, Vol. 37, No. 1, February 1988 "Coverage Prediction for Mobile Radio Systems Operating in the 800/900 MHz Frequency Range"), that the Longley-Rice model may change the predicted path loss suddenly and severely (at times, by more than twenty (20) dB). Simply stated, no predictive model is perfect, and Mr. Cohen is seriously in error by not examining (and allowing for) modeling errors in his use of the Longley-Rice model.

Further, Mr. Cohen's use of the Longley-Rice model was flawed in that it ignored the effects of buildings and vegetation (morphology) upon the strength of the received signals. Such effects have been recognized since the earliest days of radio communications and have been the subject of extensive study and research. An excellent summary and overview of this subject was published by Ms.

Longley in "Radio Propagation in Urban Areas", OET Report 78-144.

I am prepared to testify, based on both my experience and materials that have been published, that Mr. Cohen erred in not considering the effects of morphology upon predicted signal strengths. The magnitude of signal loss can range from 5.0 dB at low-VHF frequencies in suburban or rural areas with a thin tree cover to more than 30.0 dB at UHF frequencies at locations surrounded by tall trees.

Mr. Cohen's map exhibits totally ignore the question of interference from other television stations. The broadcast television spectrum in this country, particularly VHF Channels 2 through 13, has for many years been interference limited. That is to say, station coverage is limited more by interference from other stations than by a lack of signal strength. This situation has become even more pronounced recently, as a result of the FCC's effort to allocate an additional channel for every television station in the country to allow an orderly transition to a new high-definition ("HDTV") transmission system. Interference from other television stations and reception problems such as multipath ("ghosts") may prevent a household from receiving a usable signal from its local affiliate.

According to Mr. Cohen's maps, many PrimeTime 24 subscribers reside in urban areas, which have significantly

higher noise levels than exist in the rural environments on which the maps are based. It is the worst 3% (or so) receiving locations that must be considered in the case at hand, those being discreet locations at which the magnitude of the signal is less than the value specified by the FCC as representing Grade B service. The FCC specification is based on the assumption that there is no local manmade noise, which is clearly not the case at the difficult receiving locations being considered.

Mr. Cohen has also presented tabulations of field strength measurement data, as collected near the homes of some 100 (one hundred) PrimeTime 24 subscribers in Dade and Broward Counties, Florida. In the process of collecting these data, a mobile run for a distance of 100 feet, along an accessible road near the subscriber's household, was made with the receiving antenna elevated to 30 feet, while recording the station's field intensity on a computer.

The technique of collecting the signal strength data while in motion with an antenna some 30 feet in the air obviously requires that the path traversed be clear of all obstructions such as trees, power lines, and so on. By collecting the data along clear, unobstructed paths, it is virtually assured that the data will not be representative of conditions present at the subscriber's home, which may well be surrounded by trees and other buildings. Had the

signal strength data been collected at rooftop level at the subscriber's household, they would have shown the attenuating effects of "urban clutter", as discussed above.

Richard L. Biby

Richard L. Biby, PE

April 15, 1998

REBUTTAL EXPERT REPORT OF RICHARD L. BIBY

ON BEHALF OF PrimeTime 24 JOINT VENTURE

This supplemental report sets forth the opinions to which I am prepared to testify in rebuttal in the matter of CBS, Inc. et al, Plaintiffs, v. PrimeTime 24 Joint Venture, Defendant, regarding whether PrimeTime 24 is violating the requirements of the Satellite Home Viewer Act.

My qualifications are set forth in my original Expert Report previously filed herein.

Since submitting my original report, I have had the opportunity to review the April 1998 report submitted by Mr. Jules Cohen on behalf of Plaintiffs. As was the case with his prior 1997 statement herein, discussed in my original Report, Mr. Cohen has again provided predicted signal strength maps for a variety of TV stations around the country, using a Longley-Rice methodology. He apparently has continued to use a 30' antenna height in those predictions, and a 50% location probability (that is, he has provided maps showing the areas within which the Grade B signal strength is expected to be present at 50% or more of the locations), and he has continued to neglect morphology (that is, the effect of vegetation and buildings on propagation). As set forth in my original report, these

are unrealistic and inappropriate assumptions, in my opinion.

First of all, the SHVA requirement that a Grade B signal be receivable with a conventional rooftop antenna requires that the signal be present at the height -- say 5' above the rooftop - where such an antenna would be located. But in many areas of the country, where one-story homes prevail, a conventional rooftop antenna typically would be located at about 20', not 30'. Thus, Mr. Cohen's maps consistently overestimate the areas within which Grade B signals can be expected to be received.

Second, Mr. Cohen's maps show the area within which 50% of locations can be expected to receive a Grade B or greater signal. But by definition, at such locations 50% of households *cannot* receive Grade B signals. Considering the fact that PrimeTime 24 does not reach more than about 3% of United States television households, that is an inappropriate criterion to use. It would be more appropriate to calculate maps showing areas where 97% of locations can receive Grade B or stronger signals. Thus, for this reason too, Mr. Cohen's maps consistently overestimate coverage maps for purposes of SHVA.

Finally, as discussed in my original Report, Mr. Cohen's maps ignore the effects of morphology (that is,

vegetation and buildings) upon signal propagation. Mr. Cohen's maps therefore are deficient in not taking this factor into account.

As also discussed in my original Report, I have developed a computational algorithm that improves upon the original Longley-Rice methodology used by Mr. Cohen.

In order to demonstrate the effect of these factors in the real world, I have prepared two Longley-Rice maps. One map was prepared under Mr. Cohen's assumptions. The other was prepared using the improved morphology algorithm, a 97% locational probability and a more realistic assumption of a 20' receiving antenna height instead of Mr. Cohen's use of a 30' height.

Attached hereto as Exhibit A is a Longley-Rice map of Television Station WTTG, Channel 5, Washington, D.C., calculated using Mr. Cohen's parameters, and showing the 47 dBu (Grade B) signal contour assuming a 50% locational probability, a 30' antenna height, and no morphological corrections. This corresponds to the map Mr. Cohen would generate for this station. Attached as Exhibit B is a map calculated for the same station with only three adjustments made: a 97% locational probability is used, a 20' antenna height is assumed, and a morphology correction is added. The 97% locational probability calculation is carried out

as described in my original report, using a 2.2-sigma adjustment to the median 47 dBu field strength. To be conservative, I assumed that 1 (one) sigma was equal to 8.3 dB; as discussed in my original Report, this is the sigma derived from Ms. Longley's published formula.

The striking difference between the maps reveals why it is misleading in the extreme to utilize Mr. Cohen's maps to predict where Grade B signal strength can be received for purposes of SHVA compliance. The same dramatic difference would be observed for any television station for which Mr. Cohen prepared maps. Mr. Cohen's maps do not demonstrate that the vast majority of PrimeTime 24 subscribers are ineligible.

Richard L. Biby, PE
May 28, 1998

EXHIBIT A

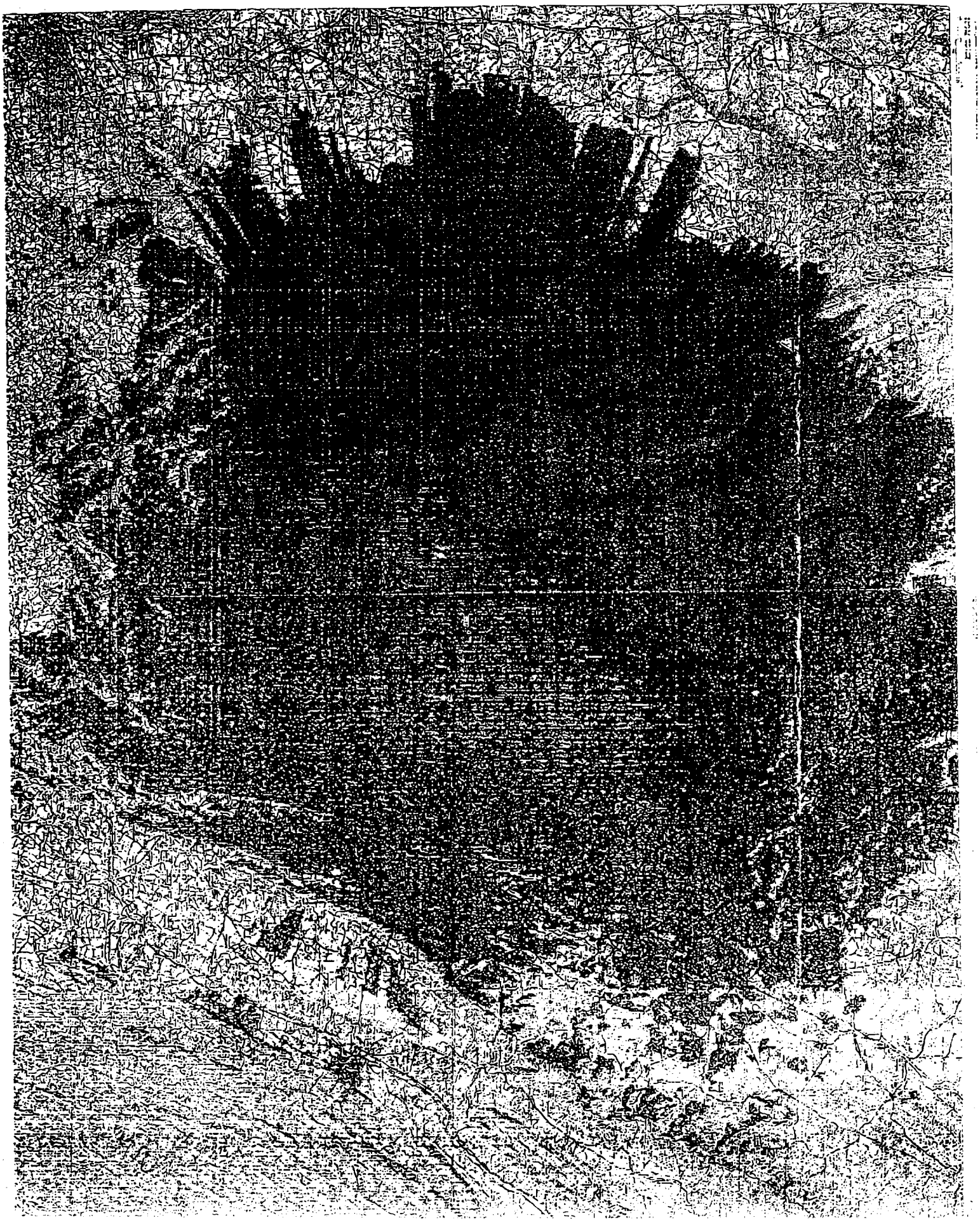


EXHIBIT B

Initial Comments of PrimeTime 24 Joint Venture in Response to Notice of Proposed Rulemaking – CS Docket No. 98-201; RM No. 9335, RM No. 9345 - In the Matter of Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act: Part 73 Definition and Measurement of Signals of Grade B Intensity.

TAB B

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF FLORIDA

MIAMI DIVISION

CBS INC., ET AL.,	.	CASE NO. 96-3650-CIV-NESBITT
PLAINTIFFS,	.	MIAMI, FLORIDA AUGUST 13, 1998
V.	.	11:53 A.M.
PRIMETIME 24 JOINT VENTURE, ET AL.,	.	
DEFENDANTS.	.	

TRANSCRIPT OF TRIAL PROCEEDINGS HAD

BEFORE THE HONORABLE LENORE C. NESBITT,

UNITED STATES DISTRICT JUDGE.

- - - - -

VOLUME 4

- - - - -

PROCEEDINGS RECORDED BY MECHANICAL STENOGRAPHY, TRANSCRIPT PRODUCED BY COMPUTER.

THE COURT: OKAY.

MR. SPECTOR: THE SCHEDULE WHICH WAS PROVIDED YESTERDAY AND ALREADY BEEN NIGHT FILED WITH THE COURT IDENTIFIES IN SPECIFICITY WHAT IT IS THAT WE'RE TALKING ABOUT.

THE COURT: ALL RIGHT. PRESENT YOUR WITNESS, PLEASE, MR. DEUTSCH.

MR. DEUTSCH: THE DEFENSE CALLS ROBERT CULVER.

(ROBERT CULVER, DEFENDANTS' WITNESS, WAS SWORN.)

THE COURT REPORTER: PLEASE SIT DOWN. PLEASE STATE YOUR FULL NAME FOR THE RECORD, SPELLING YOUR LAST NAME.

THE WITNESS: MY NAME IS ROBERT CULVER, C-U-L-V-E-R.

DIRECT EXAMINATION

BY MR. DEUTSCH:

Q. WHERE DO YOU LIVE, MR. CULVER?

A. I RESIDE IN SILVER SPRING, MARYLAND.

Q. WHAT'S YOUR OCCUPATION?

A. A PROFESSIONAL ENGINEER, CONSULTING ENGINEER TO THE COMMUNICATIONS AND THE BROADCAST INDUSTRY.

Q. DO YOU HAVE AN AFFILIATION WITH A COMPANY OR ENTITY?

A. YES. I'M A PARTNER IN THE FIRM OF LOHNES, L-O-H-N-E-S, AND CULVER IN LAUREL, MARYLAND, L-A-U-R-E-L.

Q. TELL US, PLEASE, WHAT YOUR EDUCATIONAL BACKGROUND IS IN

YOUR PROFESSIONAL FIELD?

A. I HOLD A BACHELOR OF ENGINEERING DEGREE IN ELECTRICAL ENGINEERING AWARDED BY THE UNIVERSITY OF MARYLAND, AND HAVE COMPLETED SOME ADDITIONAL CONTINUING EDUCATION WORK IN RELATED SUBJECTS.

Q. WHEN DID YOU FIRST DO COMMUNICATIONS ENGINEERING RELATED WORK?

A. I HAVE BEEN EMPLOYED WITH THE FIRM OF LOHNES AND CULVER -- IT WAS STARTED BY MY FATHER PRIOR TO MY BECOMING A FULL-TIME EMPLOYEE THERE. BUT I SAY PERHAPS A THRESHOLD DATE MIGHT BE LATE 1960'S PRIOR TO GRADUATION FROM COLLEGE.

Q. AND OVER THE YEARS WHILE AT LOHNES AND CULVER, WHAT KIND OF PROJECTS HAVE YOU PARTICIPATED IN AND LATER ON LED?

A. THE RANGE OF WORK COVERED ALL ASPECTS, FROM BEGINNING AS AN ENGINEERING ASSISTANT IN THE OFFICE, PROGRESSING TO DIRECT CONTROL AND DESIGN OF ENGINEERING PROJECTS, AND FINALLY TO MORE CONTACT WITH CLIENTS WITHIN THE FIRM.

Q. NOW, YOU'VE USED THE PHRASE "COMMUNICATION" BEFORE. WHAT SPECIFIC COMMUNICATIONS FIELD OR AREAS HAVE YOU WORKED IN?

A. THE MAJORITY HAS BEEN BROADCAST COMMUNICATIONS.

Q. HAVE YOU, IN THE COURSE OF YOUR CAREER OVER THE YEARS, DONE MEASUREMENTS OF SIGNAL STRENGTH IN THE FIELD?

A. YES.

Q. WHY HAVE YOU DONE THAT?

A. TO DETERMINE THE OPERATION OF BROADCAST SYSTEMS, THE TRANSMISSION SYSTEMS OF RADIO AND TELEVISION STATIONS AT THE REQUEST OF THE CLIENTS THAT ENGAGE US TO DO THAT WORK.

Q. TO RESOLVE THEIR PROBLEMS?

A. YES. MOSTLY IT'S TO RESOLVE PROBLEMS WITH THE TRANSMISSION EQUIPMENT, PARTICULARLY THE ANTENNA OR OTHER RELATED TRANSMISSION PROBLEMS FROM THE TRANSMITTER OF THE BROADCAST CLIENT.

Q. NOW, BASED ON YOUR PROFESSIONAL EXPERIENCE, DOES THE FEDERAL COMMUNICATIONS COMMISSION PERMIT SIGNAL MEASUREMENTS TO BE SUBMITTED TO IT FOR CERTAIN PURPOSES AND IN CERTAIN CIRCUMSTANCES?

A. YES. THE F.C.C. UNDER ITS RULES ALLOWS SIGNAL MEASUREMENTS FOR SOME LIMITED PURPOSES.

Q. WHAT PURPOSES ARE THOSE, ACCORDING TO ITS RULES?

A. THEY COULD BEST BE DESCRIBED AS PURPOSES TO DETERMINE THE SIGNAL STRENGTH COVERAGE OVER A COMMUNITY.

Q. WHEN YOU SAY "COMMUNITY," ARE YOU ESSENTIALLY TALKING ABOUT THE GEOGRAPHICAL AREA THAT THE COMMUNITY COVERS?

A. YES, THE DEFINED BOUNDARY OF THE COMMUNITY. THE F.C.C. HAS SOME PARTICULAR REQUIREMENTS FOR COMMUNITY COVERAGE, AND THE COMMUNITY COVERAGE CAN BE CONFIRMED BY MEASUREMENTS SPECIFIED IN THE RULES.

Q. AND THE F.C.C. PROCEDURES ARE FOR THE PURPOSES OF THESE AREA MEASUREMENTS OR AREA PREDICTIONS, AND HOW DO THEY --

ARE THEY ALSO MEASUREMENTS TO BE SUBMITTED TO THE F.C.C. FOR DEFINING SIGNAL STRENGTH AT A SPECIFIC SINGLE LOCATION?

MR. OLSON: OBJECTION, YOUR HONOR. I MOVE TO STRIKE THE INTRODUCTORY COMMENT WHICH APPEARS NOT TO BE PART OF THE QUESTION.

BY MR. DEUTSCH:

Q. LET ME PUT THE QUESTION IN A BETTER FORM ANYWAY.

A. PLEASE.

Q. DO THE F.C.C. RULES AND PROCEDURES PROVIDE FOR THE SUBMISSION OF SIGNAL STRENGTH MEASUREMENTS TO IT FOR DEFINING SIGNALS AT SPECIFIC INDIVIDUAL LOCATIONS AS OPPOSED TO AREAS OR COMMUNITIES?

A. NO, THEY DO NOT.

Q. NOW, IN THE CONTEXT THAT THE F.C.C. PROVIDES ITS PROCEDURES, DOES IT PROVIDE A METHODOLOGY FOR LAYING OUT WHERE THE MEASUREMENTS ARE GOING TO BE MADE BEFORE THE MEASUREMENTS ARE MADE?

A. YES, THAT'S CORRECT. THE PROCEDURE INVOLVES DEFINING A GRID OVER THE COMMUNITY, SEPARATED BY SOME REASONABLE DISTANCE, DEFINING A CHECKERED BOARD PATTERN, IF YOU WILL, OVER A COMMUNITY. AND AT EACH OF THE INTERSECTIONS OF THE GRID, A MEASUREMENT IS MADE BY A DEFINED METHOD IN THE F.C.C. RULES TO DETERMINE THE COVERAGE OVER THE COMMUNITY.

Q. AND IS THAT DEFINED METHOD THE 100-FOOT RUNS, 30 FEET IN THE AREA, THAT YOU HEARD MR. COHEN TALK ABOUT?

A. THAT IS. THAT IS A METHOD INCLUDED IN THE F.C.C. RULES, YES.

Q. AND DOES THE F.C.C. SPECIFY THAT METHOD FOR ANY OTHER PURPOSE?

A. THE ONLY PURPOSE IN THE RULES FOR SUBMITTING MEASURED FIELD INTENSITY TO THE F.C.C. IS TO DETERMINE THE COVERAGE OVER A COMMUNITY WITHIN THAT SECTION OF THE RULES.

Q. NOW, IN THE COURSE OF YOUR PRACTICE IN MAKING MEASUREMENTS OF SIGNAL STRENGTH IN THE FIELD, HAVE YOU FROM TIME TO TIME TAKEN MEASUREMENTS BY MEANS OF 100-FOOT RUNS WITH AN ANTENNA 30 FEET IN THE AIR?

A. YES.

Q. AND HAVE YOU SOMETIMES TAKEN MEASUREMENTS BY OTHER PROCEDURES?

A. YES.

Q. AND IN YOUR PROFESSIONAL EXPERIENCE, MR. CULVER, IS IT POSSIBLE TO DERIVE USEFUL INFORMATION BY SIGNAL STRENGTH FROM UTILIZING OTHER PROCEDURES?

A. YES.

Q. HOW DO YOU DECIDE WHETHER TO MEASURE ON A HUNDRED FOOT RUN 30 FEET IN THE AIR, OR HOW TO USE SOME OTHER PROCEDURE TO MAKE A MEASUREMENT?

A. IT DEPENDS ON THE TASK AT HAND, SO TO SPEAK. IF ONE IS DESIRING TO REPLICATE THE F.C.C.'S PROCEDURE OR THE F.C.C.'S PREDICTED SIGNAL STRENGTH, A 30-FOOT HEIGHT, HUNDRED FOOT

IMPORTANT.

Q. SO IF YOU HAD GONE FURTHER FROM THE HOUSE, FOR EXAMPLE, TO A ROADWAY, INSTEAD OF MEASURING AS CLOSE TO THE HOUSE AS YOU COULD GET, WOULD THAT HAVE GIVEN YOU A MORE OR LESS ACCURATE PREDICTOR OF THE ACTUAL SIGNAL STRENGTH AT THE HOMEOWNER'S ACTUAL ROOFTOP?

A. YES. THE GOAL --

Q. IT --

A. YES, IT WOULD HAVE. IT WOULD HAVE GIVEN ME -- THE FURTHER REMOVED, THE LESS CONFIDENCE I WOULD HAVE HAD EXTRAPOLATING THE SIGNAL LEVEL OVER THE ROOFTOP OF THE HOUSE.

Q. OKAY. TO SUMMARIZE, THE BEST PLACE TO BE IS ON THE ROOFTOP?

A. YES, IT WOULD BE, IF POSSIBLE. BUT OUR GOAL WAS TO GET AS CLOSE AS PRACTICAL, AND ROOFTOP IS NOT PRACTICAL.

Q. AND IF YOU CAN'T BE THERE, YOU SAID THAT THE CLOSER, THE BETTER?

A. YES, THAT WAS OUR GOAL, TO GET AS CLOSE AS POSSIBLE BECAUSE I FELT THAT WAS THE BEST PLACE TO MAKE A MEASUREMENT.

Q. WHEN YOU WERE FINISHED, DID YOU PREPARE TABLES WITH THE RESULTS OF YOUR MEASUREMENTS AND OBSERVATIONS?

A. AFTER THE PROJECT WAS COMPLETED ON SITE IN MISSOULA, THE DATA WAS BROUGHT BACK TO MY OFFICE AND I PREPARED A

A. YES, IT DOES.
Q. AND THAT IS YOUR DETERMINATION OF THAT FROM YOUR OWN ACTUAL IN-MISSOULA VIEWING IN THE HOMEOWNER'S HOUSE OF THE PICTURE?
A. YES, IT IS.
Q. AND YOU THEN RECORD THE ANTENNA HEIGHT OF THE ANTENNA?
A. THAT'S CORRECT.
Q. AND FOR THE SITES WHERE THERE WAS A FUNCTIONAL HOMEOWNER'S ANTENNA, IS THAT THE ANTENNA HEIGHT YOU MEASURED?
A. THAT'S CORRECT.
Q. OF THE HOMEOWNER'S ANTENNA?
A. THE HOMEOWNER'S ANTENNA, USING THE OPTICAL METHOD DESCRIBED EARLIER CHECKED BY OTHER INFORMATION AVAILABLE.
Q. BY THE WAY, DID YOU MEASURE ANY HOMES IN MISSOULA, OF ALL THE SITES YOU VISITED, THAT HAD AN ANTENNA AS HIGH AS 30 FEET?
A. WELL, THE SITES IN MISSOULA WERE GENERALLY LOWER-TYPE HOUSES, THEY ARE NOT REAL TALL HOUSES. AND JUST REVIEWING THE TABLE, NO, THERE ARE NONE THAT GET UP TO 30 FEET.
Q. AND YOU THEN RECORDED ON THIS FORM THE DISTANCE FROM THE TRANSMITTER AND THE DIRECTION OF THE TRANSMITTER?
A. YES.
Q. AND YOU THEN RECORDED ON THIS FORM SOMETHING CALLED RECEIVER INPUT VOLTS?

THE AIR, THEN IT MUST BE RECEIVED. THAT, I THINK, BY ITS DEFINITION, ACCORDING TO ME, MEANS IT'S RIGHT AT THE RECEIVING ANTENNA.

Q. OF ALL THE HOUSEHOLDS YOU VISITED IN MISSOULA, WAS THE 30 FEET THE APPROPRIATE HEIGHT FOR THE OUT -- FOR MAKING THE MEASUREMENT, IN VIEW OF WHERE THE HOMEOWNER'S ANTENNA WAS?

A. WELL, CLEARLY, NO. I THINK WE WOULD HAVE TO DO AN AVERAGE OF HOMEOWNERS' ANTENNA HEIGHTS, AND IT'S SOMETHING LESS THAN 30 FEET HERE.

Q. BECAUSE NONE OF THEM REACHED 30 FEET.

A. NO, NONE OF THEM REACHED 30 FEET.

Q. I'D NOW LIKE TO ASK YOU WHETHER YOU BELIEVE THERE IS A RELATIONSHIP BETWEEN THE SIGNAL AS IT EXISTS WHERE THE STATUTE TALKS ABOUT WHERE THAT ANTENNA IS, AND THE VOLTAGE, THE RECEIVER INPUT VOLTAGE MEASURE AT THE T.V. RECEIVER?

MR. OLSON: OBJECTION, AMBIGUITY.

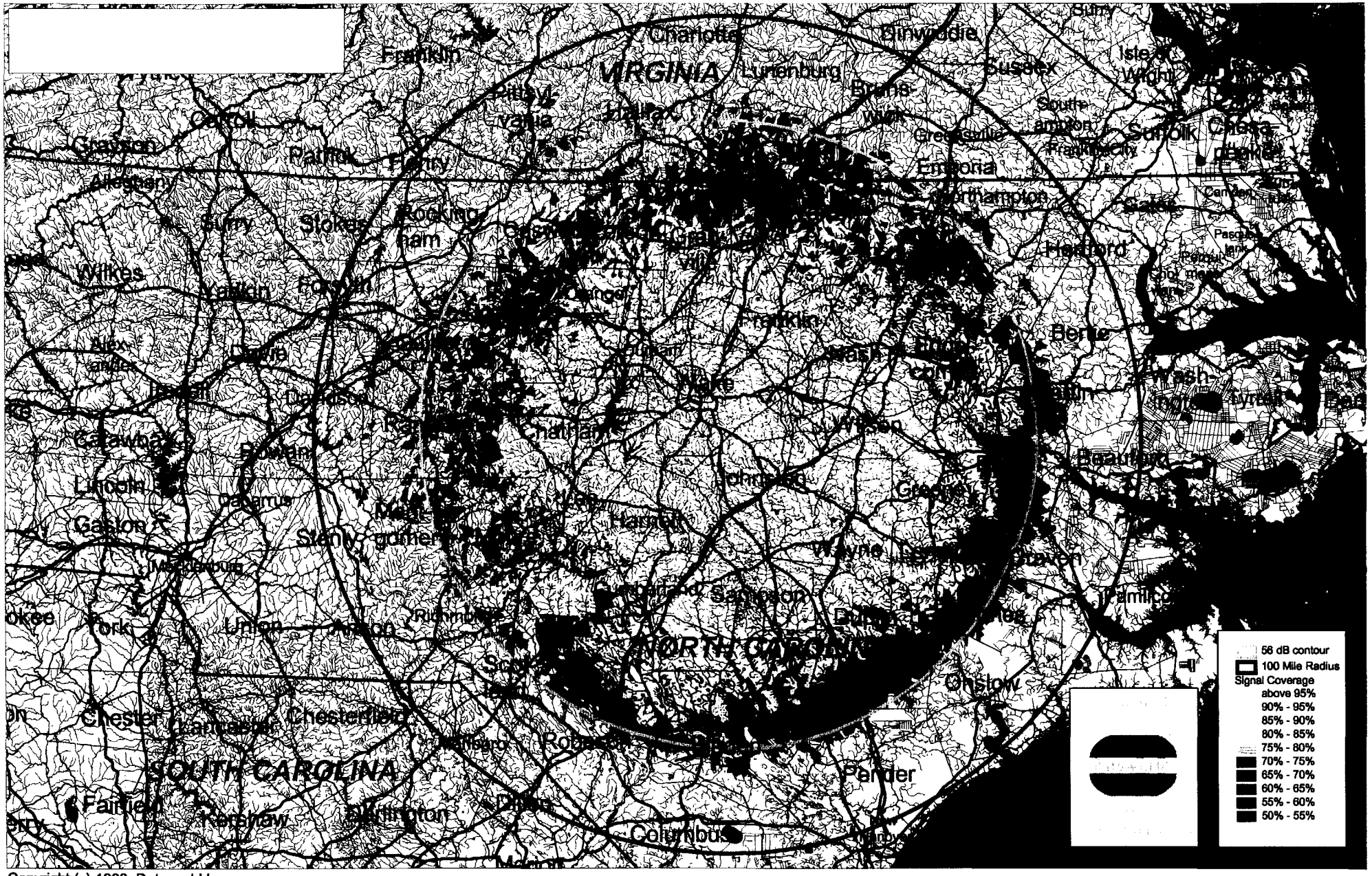
THE COURT: SUSTAIN.

BY MR. DEUTSCH:

Q. IF ONE PUTS AN ANTENNA AT THE HOMEOWNER'S -- WELL, IF ONE PUTS AN ANTENNA ABOVE THE HOMEOWNER'S HOUSE WHERE THE ANTENNA IS AND LEAVES -- SIGNAL DOWN FROM THAT ANTENNA ON A TRANSMISSION LINE TO THE TELEVISION SET OF THE HOMEOWNER AND MEASURES THE SIGNAL AT THE HOMEOWNER'S TELEVISION SET, WILL THERE BE A RELATIONSHIP BETWEEN THE SIGNAL STRENGTH IN THE AIR AND THE VOLTAGE YOU MEASURE AT THE HOMEOWNER'S T.V. SET?

TAB C

Current Grade B Values



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TAB D

Proposed Grade B Values